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ABSTRACT

Observational, exploratory and verbal learning, and verbal and imaginal processes of Pueblo Indian children were compared with those of non-Indian (Anglo and Chicano) children. Both Pueblo and non-Indian adults and children were observed, interviewed, and asked to carry out various tasks. The children attended either a Tanoan or a Keresan day school, an Albuquerque public school, a summer school, or a commune school in New Mexico or a San Diego (California) elementary school. Mapping as an observational procedure, a learning experience interview, and story retelling and drawing were used to obtain data on learning processes and modes of representation. Story retelling was explored as a possible measure of bilingualism. Pueblo children were found to be self-confident and independent at an early age; they excelled in visual representation and showed a high interest in role play. Although their verbal expression in English was not as fluent as that of non-Indians, no evidence was found to support the view of the "silent" Indian child--on the contrary, in their native languages and/or in comfortable settings Pueblo children were willing and capable verbal communicators. All of these patterns were linked to the nature of Pueblo communities and the children's place in them. (Author/NQ)

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LEARNING STYLES AMONG PUEBLO CHILDREN

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U.S. Department of Health, Education and Welfare
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COLLEGE OF EDUCATION
UNIVERSITY OF NEW MEXICO
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LEARNING STYLES AMONG PUEBLO CHILDREN

Vera John-Steiner and Helgi Osterreich

ABSTRACT

The methods humans use in organizing stable perceptions and categories out of the 'buzzing confusions' of infancy are difficult to specify. In this study, the beginning of a descriptive framework for diverse learning processes is attempted; observational, exploratory and verbal learning, and verbal and imaginal processes are discussed. Adults and children, both Indian and non-Indian, were observed, interviewed, and asked to carry out various tasks: Mapping as an observational procedure, a Learning Experience interview, Story Retelling and Drawing proved especially fruitful in eliciting data on learning processes and modes of representation. Story Retelling is also discussed as a possible measure of bilingualism.

Pueblo children were found to be self-confident and independent at an early age; they were found to excel in visual representation and showed a high interest in role play. Pueblo children's verbal expression in English was found not to be as fluent as that of non-Indian children; however, no evidence was found to support the view of the 'silent' Indian child--on the contrary, in their native languages and/or in comfortable settings Pueblo children are willing and capable verbal communicators. All of these patterns can be linked to the nature of Pueblo communities and the children's place in them. Classrooms in which these learning patterns are recognized as strengths and are built upon are at the same time successful in bringing about 'school learning', including verbal growth in English. The place of the school in Pueblo children's lives and the views of some Indian adults on education for their children are also discussed.

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We have gained immeasurably in understanding, knowledge and in friendships during the course of this work. Our sincerest wish is that in some way our project may in return benefit those who gave to us, and that it may additionally benefit all Native American children.

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Chapter I

The Cultural Contexts of Diversity in Learning and Thought

A. Introduction

Are there differences in the patterns of thought and in the strategies of learning among individuals raised in differing environments? This question, which has interested cross-cultural research workers for a long time, became of interest to us too as a result of our educational work in Pueblo communities. While working with teachers we had a chance to observe children in school and at play. One aspect of their Pueblo life appeared significant to us as it may relate to their cognitive development, namely, the opportunity these children have to observe their elders at work, over long stretches of time, while they farm or produce crafts.

The implications of this and other features of Pueblo existence which may fashion children's patterns of thought led to the planning of this research project. Our objective was to describe systems of adaptation which reveal the particulars of existence by means of which human cognition is shaped. But we were unprepared for the difficulties in implementing such a purpose; our framework for this study was hard to build. A major problem is rooted in the methods of the social sciences, which are aimed at measuring single dimensions or attributes in behavior, while we were looking for ways of identifying connections within a structure or a system.

Cole and Scribner are aware of this type of a dilemma in cognitive research across cultures, and they explore aspects of the problem, as well as some possible solutions, in their book Culture and Thought (1974). They state some basic premises about cognition in the following way: "We are unlikely to find differences in basic component cognitive processes, but socio-cultural factors play an important role in influencing which of possible alternative processes (visual or verbal representation, for example) are evoked in a given situation, and what role they play in the total performance" (p. 197).

Their formulation leads one to focus upon inter-relationships: how human beings weave into an effective strategy different approaches to the solution of problems. Cole and Scribner's basic assumptions are akin to our own, and we share with them the methodological and theoretical difficulties implicit in such a stance. The very example of visual versus verbal representations is illustrative of some of these difficulties. In our own work, we too focused upon these two aspects of thought content as features of cognition which may co-vary with cultural contexts of learning. Once having formulated such an hypothesis we found ourselves moving away from an approach focusing on systems to the measurement of single dimensions. How visual are Pueblo children, we asked, and we proceeded to try to develop measures to answer the question. This step of assessing component dimensions may well be a necessary stage in the kind of research we are engaged in, but only [illegible] the findings are reintegrated into a broader view of the nature of cognitive processes.

The conceptual tool for such a broader view chosen by Cole and Scribner is that of functional systems, first proposed by the Russian psychologist Vygotsky (in press), and further elaborated upon by his student Luria (1966). Vygotsky's notion was that in the course of development psychological systems appear which unite various separate functions into new combinations and complexes. Luria states that the components and the functional relations into which they enter are formed in the course of each individual's development and depend very closely on the social experience of the child. In this research, then, we are attempting to delineate some of these components and to discover the ways in which they enter into functional relations as a result of developmental and social experiences in early childhood and beyond. The functional system of an adult is, in this view, seen as essentially determined by the unique total experience of the child, in which the social component figures much more prominently than in traditional cognitive theory (including that of Piaget).

Because of this approach, we tried a variety of ways of gathering information about the social experience of Pueblo children and the manner in which different aspects of their learning may be integrated. In this process we were frequently frustrated by our tendency to view these children through the prisms of our own experience, to exaggerate, at times, some feature of their lives because it contrasted with that of 'mainstream' children. An alternative approach proved more productive: we explored through interviews with Indian teachers and aides their notions of the learning process. In the course of these interviews they discussed their recollections of what, from whom and how they, themselves, learned as children, they spoke of observational learning, the cognitive implications of childrens' respect for older members of their families, and styles of active teaching engaged in by traditional Indians in their efforts at working with younger children.

The interviews with Indian adults became an impetus to explore theoretically some aspects of the learning process which are usually neglected. Of particular concern are those experiences in the home and in the immediate communities of children which contribute to their intellectual growth -- these have not been fully explored in the past because of the preference of most developmental psychologists for the structured settings of the laboratory. However, the work of Jean Piaget, and of the developmental psycholinguists point to the importance of research conducted in childrens' home environments.

In this first chapter, we will describe three 'components' of learning, as they emerged from our work with Indian adults and children as well as from an examination of introspective and anecdotal evidence collected among non-Indian adults.

The approach we used, namely interviews and self-reports in which learners describe their cognitive strategies as they know them yields an appreciation of the diversity of learning processes. We have interviewed forty Indian adults and analyzed the written reports of fifty non-Indian college students. (Our data-collection methods are described in Chapter III.) Their experiences and insights will be referred to in describing three kinds of learning processes as developed in the diverse settings of childhood and the ways in which these are combined, as well as the kinds of symbolic representations which are the context of cognition.

B. Observational Learning

Pueblo children observe adults in the context of many activities, and one of those most frequently remembered by adult women is the baking of bread. A woman who is 71 years old recalled in one of the interviews, that when she was a child, bread dough was prepared in a washtub, and that the water used for it had to be carried from the river. After the dough was ready and placed in a warm corner, children would ask for a piece of it with which they would make their own small bread.

Some observations are remembered over a long period of time without any practice of the activity involved. One of the women interviewed described that because she made a big mistake baking bread when she was a teenager, she was afraid to try again for a long time. But when her grandmother was no longer there, years later, she and her sister baked bread on their own; she found that just by watching she had learned enough to be able to do it right. A young man described the same type of long-term memory for another activity:

> Just this summer, the wife and I were talking about taking it /pottery/ up as a hobby and maybe there may be some profit in it. We're trying to, we don't know the first things about it. She says that her mother knows something about it. Yet, when I think about it, I remember a lot of things that my grandmother used to do, she never actually taught me, but I just watched her like the kinds of mixtures that they used to make the clay and the way they processed the cow manure and those kinds of things. And how she enclosed the fire pit to bake the pottery. I even went back to the same places that she took me to gather that stuff. She used to put them on her back. It really amazes me how I picked up as a youngster from her just in passing. Maybe, it was because it was never forced on me, I was never criticized about it, I was just...
> You watched it and sometimes she would come and say this is the way to do it.

This last description highlights some important aspects of learning by watching. Pueblo children observe adults involved in large sequences of activity which constitute meaningful continua. Watching is never discouraged; children are allowed and expected to take a larger and larger part in the performance of these activities as they grow older; children are not expected to perform in a short time and are not rebuked for making mistakes.

Exposure to processes that lack complexity are of little use for significant kinds of learning. But when children are part of the complex life of a community they can choose out of a range of meaningful possibilities those of particular significance to them. The process of jewelry making is interesting in this respect. In one Pueblo community where jewelry is produced in every household, children pick up objects of little value, such as a penny, and set it into a ring or necklace. They are not allowed to work with valuable turquoise or silver, but they use their observations to replicate with other materials what their parents do. Nobody teaches them to make jewelry, but as their lives are interwoven with thoseof adults, they are invited to learn instead of being forcibly taught. It is likely that this kind of learning is powerful and of lasting value.

One of the reasons that observational learning is significant as a component of learning systems is that it takes place among people the child is emotionally involved with. Recognition of the importance of personal attachment emerged in these interviews where Indian adults always named the specific relative they tended to watch (father, mother, aunt, grandparents, etc.). In addition, they usually named one particular individual who had a profound influence in their lives and thinking.

While Indian adults from Pueblo communities, and those from Navajo and Crow towns all mentioned learning by observing as a critical aspect of their history, out of fifty non-Indian college students, only one woman, raised in a rural community, mentioned watching as a significant aspect of her upbringing. Non-Indian adults simply do not mention observational learning as part of their strategies; nevertheless in their descriptions of some of their approaches watching plays a part. For instance, some of the students in their self-reports described how they seat themselves in lecture halls where they can achieve eye contact with an instructor and observe his/her gestures and expressions. These clues are helpful to them for remembering the verbal content of the lectures. Most students in a cross-cultural psychology class viewed their strategies of learning as shaped by schools, by a "Western" method of teaching and thinking. This is well described by an older woman in the class:

> Being raised in a small rural community my experience agrees with Cole and Scribner that classifying operations do seem to change in certain ways with exposure to Western or modern living experiences. Taxonomic class membership seems to play a more dominating role as the basis for grouping items when people move from village life to towns more and more affected by commerce and the exchange of people and things. My learning in the rural setting was by observation, e.g. watching my mother bake bread. Once I started my schooling and then moved to an urban community most of my learning has been by verbal explanation and rehearsal.

It is possible that non-Indians ignore observation as a significant learning process because it is not tied to a reward system. The adult model on whose behavior the child's learning is based does not punish the child for slowness or failure; what is learned is motivated by the child's needs and curiosities. The Indian man who recalled his grandmother's pottery making emphasized this point in his discussion quoted above, but in mainstream society learning from a "teacher" who has power over the child is viewed, it seems, as more significant.

A few significant features of learning need to be delineated in this discussion of observational processes. Selective attention refers to who it is that the child focuses upon and in the context of what activity; memory for an activity may be of shorter duration or longer lasting as described in the above example; reward systems are considered basic by some learning theorists -- in the case of observational learning the child's interests provide much of the motivation for watching, and inner satisfaction in ability to duplicate the significant activities of adults is often the reward. An additional aspect of learning processes which is of significance to this discussion is the kind of symbolic representation implicit in the acquisition of a new process. We frequently ask the question: How is information stored? As pictures, words, movements? It is likely that in observational learning where the verbal aspect of the process is slight the inner representation of what has been learned is replete with images and movements.

An unusual instance of identifying the circumstances in which a recurrent experience contributed to an important method of representation was described to me by a well known experimental psychologist.* The Berkeley psychologist had spent many Saturdays during his childhood eagerly watching sports events and enjoying them vicariously as he was unable to participate in sports due to a rheumatic heart. As an adult, subtle changes in body posture have formed the basis of many of his personalized memories. In this example, the interviewee indicates clearly the social conditions which were responsible for the development of representations.

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*Personal interview with the senior investigator, Berkeley, July, 1972.

It is likely that observational learning contributes heavily to visual representations. Our evidence is quite indirect. In an interesting study of long-term recall, Bahrick, Bahrick and Wittlinger (1974) found that people out of high school for more than 30 years still recognized over 90% of their classmates' portraits. This is one kind of learning that did not involve tutoring; students see their peers daily, and store their image. The task of remembering the names of their peers was much harder, but it was made easier when the picture of an individual to be remembered was placed in front of the subject. The researchers found that high school graduates were "most likely to recall close friends or persons in whom they once had a romantic interest" (p. 56). It is not surprising that in a task where people were not instructed, nor rewarded or punished when learning, factors of emotional investment were essential.

Observational learning is most frequently identified as a critical apsect of intellectual development by people raised in Indian communities. In these settings the closeness of family members, the mutual responsibilities shared by members of a community which has limited economic resources, and the belief that Indian traditions are important but should not be 'rammed down' children's throats, all contribute to learning by watching and learning by identifying with loved and respected individuals. It is our contention that such learning does take place in many other social settings as well, but is not as clearly identified or remembered by those who experience it. One group of American psychologists studied learning by observation in laboratory settings; Bandura and his coworkers at Stanford University (1963) have conducted many studies which focused on modeling. In one study (1961), they found that preschool children imitate the behavior of nurturant adults rather than that of those who exhibit neutral affect.

It is of interest that laboratory findings confirm the importance of nurturance as an aspect of observational learning. The Indian people interviewed in the course of this project occasionally described how they learned from older children; however, their significant models were people one or two generations older than themselves. The respect people have for their elders does not rest on fear, but rather on reverence for the vast knowledge that elders have and on love. One of the women interviewed described her relationship with her grandparents in the following way:

> Well, one thing in mind that I will never forget is that grandpa always told us that the things that are here on our Pueblo we should go by because

> in the future we might lose a lot of our interests and that way if we learn now, then you will still know about it in later years. Like for instance, he taught some of the ways of life, and he always mentioned things that you learned now you should be able to teach your family...In return you can help them out with many of the things that they never had and I think that if they've taught me and right now I'm learning more. I wish I had both my grandparents here so I could help them and repay them for what they taught me.

A man describes his learning of Pueblo culture this way:

> It was a matter of understanding such things as who was the source of authority and knowledge and whatever Pueblo ways are important to our family as we lived anywhere in the country. This was found in terms of who the great-aunt was and that she served as--a kind of a fancy term--matriarch in our family. Well, simply again the experiences would be that whatever I was told or taught wasn't by lesson, but by demonstration of what I guess was the meaning of something like an extended family and this would be seen through how one observed the behavior of people toward other people, in this case this older aunt.

The loving and close relationship with elders is basic to the sense of identity many Indians develop. One of the men teachers we interviewed expresses this well:

> It kind of gives you a place, of all the things they tell you, a place of belonging, where you come from, where home is, things like that. I think an Indian child is very much at home. He knows where he is going, he knows where he comes from. I think that has a lot to do with being proud of who you are...

All children identify with their elders to some extent, or as one Pueblo woman put it: "I think of her /her mother/ and I think of all those traits I have that come from her, and I got them early in childhood." But the Indian view of the relationship across generations is different from that of people raised in westernized settings. The realities of the division of labor, of the professionalization of roles, is so deeply ingrained that it even affects the way individuals raised in such a society think of their childhoods. A clear division is drawn between teachers who instruct you and give you valuable skills, and your relatives. It would be unusual to encounter among those who are influenced by the rapidly changing life-styles of industrialized societies the Pueblo view: that one is always an "apprentice" to others who are older and more experienced.

C. Learning Through Exploration

Children learn from older people, their peers, and friends; and they also learn on their own. There is an alternating rhythm in their lives where time spent in the company of others is interspersed with time spent in solitary exploration. A number of psychological theories also place exploratory learning into a central position, the most important of these being Piaget's work. The examination of objects, taking toys apart, the adventures of the mind engaged in during the slow hours of the day, or roaming the woods and playing in the fields during summertime -- all these playful activities develop a sense of wonder and sharpen children's curiosities.

The sense of wonder is crucial to the development of the scientific imagination. Einstein spoke of it in an autobiographical essay (Schlipp, 1951). He recalled that he received a compass from his father when he was four or five years old; he was surprised to find that the needle of the compass "behaved in such a determined way." He wrote, "this experience made a deep and lasting impression on me; something deeply hidden had to be behind things" (p. 9).

The effort involved in discovering the hidden aspects of things is seen as an essential aspect of children's mental growth. Piaget (1954) views the growth of operations as fueled by these explorations, which in turn lead to the development of cognitive structures. And while Piaget does not stress interaction with others as an important foundation for the development of these operations, other developmental psychologists, for instance Lois B. Murphy (1972), emphasize patterned exchanges with the mother as essential for the subsequent development of complex play.

In our own framework of learning, exploration is viewed as an essential phase of learning, during which children exercise their growing skills without the pressures of being observed or judged. Piaget describes these processes primarily as active manipulation of objects, but learning on one's own is of importance even as part of a primarily social process, such as the acquisition of language. A two-year old boy named Anthony was recorded by his mother Ruth Weir (1962) when alone in his crib. During his monologues, he was practicing and extending all aspects of his speech -- intonations, sounds, grammatical forms -- while alone with only the tape-recorder present.

These pre-speech monologues illustrate one function of exploratory play, that of the mastering of skills. We view the impetus for play as linked to the child's development as a member of the social group in which he/she is nurtured, stimulated, instructed, and ignored. Others may see it as a biologically given feature of humanness -- an instinct even. We are interested in the way in which this type of learning process alternates with other aspects of development which are predicated upon the presence and active role of more mature organisms. At times, the young child's capacity to explore playfully is short-lived; the social conditions of learning may interfere or inhibit this aspect of development.

Examples of such an inhibiting relationship were given by students who were asked to describe their habitual ways of studying and the ways in which they generate fresh and new ideas. A number of them noted sadly that the price they have paid for developing to a fine art the necessary memorization which helped them to get good grades in high school and college has been a reduction of their ability and freedom to play and explore ideas on their own. Nevertheless, intellectual work requires that a person should be able to do both.

In his influential book, The Art of Scientific Investigation, W. Beveridge ascribes an important role to childhood exploration: "a research worker is usually a person whose curiosity [in childhood] is turned toward seeking explanations for phenomena that are not understood" (1957, p. 90).

In the past few decades, the theoretical emphasis placed on teaching methods which foster curiosity and exploration has increased. Thus educators and psychologists are confronting the challenge of developing the cognitive abilities of all children to the fullest, at a time when societal complexity and interdependence is increasing and rote work is decreasing. If indeed scientists, engineers, even salespeople need to have adventurous minds to be successful, schools have to contribute to such a goal instead of interfering with it. A number of contributors to a symposium on Play and Development (Piers 1972) emphasize the central role of play in cognitive and affective growth. In the summary article of the volume Erikson quotes Piaget's recommendations for a new and 'liberating' curriculum: "children should be able to do their own experimenting and their own research... In order for a child to understand something he must construct it himself, he must re-invent it" (p. 132). Erikson develops further the theme of playful exploration. His analysis is based, in part, upon a project he and his coworkers were engaged in: they collected play constructions from 4- and 5-year-old children from different backgrounds.

The child puts together on a low table blocks and toys which represent many features of his real or imaginary world. In analyzing these constructions, Erikson concludes that dramatic play of this kind fulfills a variety of important functions, among which are the child working through a traumatic experience, as well as his/her renewal through play. A function which has been broadly observed in this and other cultures is that of the growing mastery of skills (see language example above). And, finally, Erikson mentions that through play children strive to master complex life situations. The importance of play, in his analysis, is that it allows children a certain freedom to maneuver without the chaos of lack of boundaries. He compares childhood play with drama, and views play as a significant thread throughout life.

Thus, play is crucial for cognitive development, for emotional renewal, for the sense of freedom and creative development which is the antithesis of highly ritualized learning; play and exploratory learning are an essential component in the alternating rhythms of development.

Clearly, psychologists recognize the role of exploration in human development; however, in our interviews there was no mention of this kind of learning. Perhaps activities which are here called exploration are seen as play and idleness by people when thinking about their own experiences, and therefore do not emerge when they are discussing 'learning'.

In Piaget, the consequences of learning through exploration are the internalization of conceptual schemas. We are interested in the externalization of these consequences as well; how new learning is communicated, tested, and refined through dialogue.

D. Learning as Verbal Dialogue

1. Introduction

Of all the most diverse aspects of human learning, verbal learning is the most widely studied and analyzed. However, the choice of the setting in which people are studied when learning words, or learning with the help of words, affects the significance of the findings. Most of the studies in this area are carried out in laboratories; the focus of these investigations is upon the input: the systematic variation of the stimuli are assessed in their effects upon the rate and efficacy of learning. The key variables in these studies are the familiarity and meaningfulness of words, the way in which they are presented to the subjects (as paired-associates or serially), and how reinforcement conditions influence the verbal learning process. These types of studies date back to the beginning of the century; more recently, organizational and mediating processes used by subjects have been added to the issues being investigated. (Ellis, 1972)

To what extent subjects should actively participate in experiments has only recently been raised as an important issue. Jerome Singer (1975) sees a shift in experimental paradigms as well as in the underlying assumptions governing the work of psychologists. He comments that instead of viewing people as hydraulic systems, or as stimulus-response clusters as was done in the past, a person is now seen "as an information-processing creature, an image maker who steers his way through complex and tricky physical and social environments" (p. 727).

But new interest in information-gathering and in cognitive processes has not resulted as yet in much information gathering about learning outside the confines of the laboratory. We found the lack of such information a problem in our own efforts in working with Indian children. We wished for a rich descriptive lore to draw upon, but instead we encountered many simplifications about thought -- for example, the recurrent distinction that is made between abstract and concrete processes. The poverty of the psychological language and the pervasive stress upon quantification affected adversely our own efforts at observational research. It is for this reason that we initiated several approaches to the collection of descriptive data about learning and cognition.

The interviews with Indian adults and the self-reports of college students were helpful in generating some new categories for the examination of the continuous flow of human reflective efforts. The students were asked to observe themselves and make notes about their own study methods and their efforts at productive thinking. They examined their own behavior during lectures, their note-taking approaches, their way of studying their assigned readings and textbooks. How and when they discussed the content of their studies with others, and their visual strategies for storing and retrieving facts and ideas were among the varied processes they noted.

There is a body of research, first initiated at the turn of the century, which supports the use of introspective information for specifying individual differences in cognitive styles. Paivio (1971) summarized these findings and he also constructed a questionnaire for eliciting information about reliance upon visual imagery and/or verbal representational processes among college students. While these instruments are of great interest to us, we preferred a more open-ended method where students used their own language for describing internal processes, and where they were given a certain period of time to make observations dealing with their own overt and covert activities and processes.

The fifty University of New Mexico students who participated in this study were exposed to lectures, they were assigned readings and they participated in classroom discussions dealing with cognitive strategies. Then, a two-week data collection period was designated which included the period of final examinations at the end of an academic semester. We chose this period in order to maximize the likelihood that students would report effective strategies aimed at passing their courses. In order to sharpen their observations, we urged them to use contrastive situations (i.e., their methods of study in a biology class versus those employed in preparing for an examination in a foreign language).

In the analysis of these self-reports, some of the categories which emerged were quite similar to variables specified in the experimental literature (e.g., selective attention and retrieval cues). But many additional features of learning strategies were identified from these self-observations which helped us in this effort at conceptualizing functional systems in human cognition.

2. Selective Attention

Students are exposed to a torrential flow of language while sitting in a lecture room; their job is to stay awake and to capture the essential elements of what is being said. The strategies of selection used by them reflect their previous experience as students, their knowledge of the particular field being taught and their level of anxiety. One of the students described the process of note-taking in her self-report in the following way:

> Even now it is difficult for me to feel confident about selecting the most important points of a lecture for my notes, I am so afraid of missing something that is being said. I try to take it all down. This fanatical copying down of words results from a lack of training in careful listening.

The art of note-taking preoccupies all students; some have well developed 'emic' categories in a particular academic subject, and organize their notes according to these. In such a familiar context they take short notes, frequently one word titles. This form of processing resembles the condensed form of language Vygotsky (1962) spoke of as inner speech. A multi-lingual student gave an interesting description of how she writes her notes in several languages: "whichever language the word is processed in first (in English, or Hebrew or in Spanish) it is the one that gets written."

Some students avoid a process of translation or condensation, their behavior is well captured by this description:

> I furiously copy notes with the prevailing rule of quantity rather than quality. My attention is concentrated only on the section of information currently given in class.

Variations in the process of note taking, then, do exist; students do not all condense the flow of speech into key words or phrases. Those among them who have been away from college for a while or who are unfamiliar with the particular subject matter being taught are least likely to take condensed notes. These differences may be analogous to the different stages of internalization described by Vygotsky in the transition from overt to covert speech in children.

In Vygotsky's schema, overt dialogue plays a crucial role; but in lecture classes there is very little verbal interaction between students and lecturers. One student misses this opportunity, she tries to create it inside her head:

> I have the sensation of conversing with the lecturer. I restate things in my head, connect ideas quickly to past concepts I have acquired, try to recognize contradictions in the lecture and I form questions in my mind to keep my brain from getting left behind on a certain point.

This method of actively working with what one hears while listening to a lecture is akin to what many students do at a later stage of their studying -- elaboration. The lack of opportunity for verbal discussion and exploration between students and their teachers places a severe burden on both parties. Lecturers have to be well organized, and varied in their styles of teaching in order to sustain the students' interest. The students need to develop strategies to actively assimilate what they are taught either during a lecture or when they work to understand and remember what they have heard.

Interestingly, one of the Pueblo aides that we interviewed verbalized these very same processes and strategies. She talked about taking outline-type notes when the subject was familiar; more extensive notes when it was not. She also mentioned the discussion of lectures with fellow students as a very helpful process in the understanding and retention of the subject.

3. The Storing, Elaboration and Recall of Information

The methods which students have developed as part of their study habits are taxonomic, visual and verbal. Some students have hit upon the learning style of mixing mental images with language, an approach which has been found helpful in laboratory studies of learning as well. (Ellis 1972) Powerful strategies of storing and elaboration are practiced by those individuals who are eager to avoid the panic of last-minute cramming. Their strategies used to this end are of interest as they illustrate behavior which has been perfected by individuals over the span of several years.

One student describes her use of several strategies depending upon the kind of examination she is preparing for:

> When studying for an essay-type examination, I usually try to reorganize material several different ways (theoretically, developmentally, attitudinally, temporally, or any other organization that can be applied to the material). Studying for multiple choice examinations often requires a superficial understanding and an intensive memorizing exercise, utilizing only one organizing and connecting principle.
>
> Recall is easier when I have a mental "image" of relationships; and, if I have used many organizing principles, the image seems to have the qualities of a multi-dimensional model.

The necessity of translating material into a new and meaningful form is mentioned by many students. One of them described how he recalled a historical discussion in one of his classes -- the discussion pertained to the political advance and subsequent backlash in the life of women early in this century -- he 'saw' these changes as an oscillating spring.

Such imaginative examples of organizing and translating processes of memory storage and retrieval illustrate the complexity of adaptations humans develop in their everyday cognitive strategies. The flexible deployment of varied strategies mentioned by students -- depending upon the type of class and examination they study for -- forces one to look for theoretical and methodological approaches to the study of human cognition which emphasize functional organization, rather than simple typologies of "high verbal" or "high visual" subjects.

There is an interesting overlap between results reported in laboratory studies of memory and some of the memory 'tricks' students speak of as part of their study habits. These commonalities are particularly striking in the acquisition of subject matter which is easily divided into smaller units. The following excerpt details a few of the oft-reported methods used by students for memorization:

> When I am faced with a rote memory situation, I frequently encode the information, in order, by reading the list of words several times, then memorizing the first letters of the words involved. If, by chance, the letters form a word, all the better. If not, I am satisfied to memorize the letters. After a few more subsequent reviews, I can successfully recall my letters when the situation calls for it, and the letter cues are sufficient enough cues for me to recall the words.
>
> To store a more elaborate concept, I again resort to several reviews of the pertinent material, and then I attempt to further engrain the concept by developing my own example of the situation that is the extension of the concept. I feel that by developing my own example I understand the remembered concept better.

4. Productive Thinking - New Ideas

While self-reports were replete with detailed descriptions of study habits, it was difficult for students to describe how they generate new ideas. Some of them blamed their proficiencies in remembering what they were taught as the source of their difficulty, a hindrance to the development of their own individuality in thought.

> I have learned through my Western schooling to proficiently prepare for tests and research projects and to give the teacher the feedback she/he wants to hear in order to gain a high rating, through memorizing. This ability to memorize has been transferred into other areas of this society in that I can store and reorganize directions in the streets, find useful strategies for reading a map, and easily identify stimuli that is new to my scheme. This capacity for rote memorization however, has all too often hindered my ability to spontaneously create and develop ideas as often as I'd like to, leaving me a victim of its ambivalent effects.

The heavy hold of learning strategies which are useful in one setting, but might be inhibiting in another is a matter of conscious awareness to many people. In one self-report a student writes, "Developing new ideas can only happen for me when I am relaxed and unhurried." Another student speaks of her position in society as related to her methods of generating new ideas:

> My own method of generating research, I've recently noticed is based on making an intuitive connection between personal observations and then attempting to explain how the observations are in fact connected. I have noticed that I seem to be much better at

> observing and intuiting connections than at constructing formal theories. I connect this in part with my female role in this culture. At any rate, the important point here is that the strategy that is most comfortable and to a certain extent most fruitful might need to be modified and combined with another strategy, especially when it comes to developing new ideas.

There seems to be considerable evidence that women excel in verbal approaches to learning while men are more effective in spatially linked strategies. (Maccoby and Jacklin, 1974). It is interesting that in this section of self-reports, men and women students differed in their descriptions; more examples of visual analogies were given by men in sketching their innovative processes, such as this excerpt from a male student's report:

> In this point (i.e., the creative process) humans are unique. This process of creation is the least salient to myself. It may be likened to a day-dream. I visualize many ideas which are in the form of small clips from a motion picture. They are dynamic, in that they have many dimensions; movement, color, sound, time, etc. These "clips" are purely random in their sequential appearance, and many are seemingly unrelated to the idea being contemplated.
>
> At this point something unexplainable happens; somehow some or all of these random ideas become anchored to the topic originally considered. It is then that I attain the strategy for organization, as well as an overall feeling of what and how to write.

The issues of how to utilize schooling in developing oneself fully and at the same time maintain some inner direction and certainty has also preoccupied some of the Indian adults we interviewed. Education is pushed upon people who live outside the mainstream or Western culture -- in the United States as well as in the developing nations. Thus, the role of education versus traditional methods of learning, and the role of self-direction versus expediency cause conflicts in many bi-cultural individuals. Themes dealing with these issues will be discussed further in our last chapter devoted to Indian education. One quote from an Indian engineer is highly relevant to this discussion of creativity and conflicts in personal direction:

> I get a feeling that there is a basic difference between pursuing something that you are good at to begin with and just pursuing something because you think it has a good future. Or because it is hard to do and therefore it is hard for everybody. I think it winds up with two different kinds of people. One of them is a master at something, and the other is an artist.
>
> For instance, in the field I am in right now /electric engineering/ I can take somebody's idea and make it better. But I am not the kind of guy who is going to come up with something startlingly different. That takes somebody who loves that kind of work. It's just like painting a picture. If I practice I might be able to paint one but it is not going to look like the guy's who can do it because he's got the talent and love for it.

E. Social Contexts of Verbal Learning and Verbal Thought

The observations of students gathered in the context of this investigation are similar to the findings reported by Cole and Scribner (1974) -- namely, that schooling produces and reinforces distinctive approaches to memory and problem-solving: "...attendance at school apparently encourages an approach to classification tasks that incorporates a search for a rule -- for a principle that can generate answers..." (p. 122). Such an approach often means the extensive use of verbal strategies, a requirement which has a long tradition in Western style education.

In our work with Pueblo adults, we found that an emphasis on verbal rules and explanation was of great importance to them in their interactions with children, even though some of the teaching adults have not had much formal education themselves. The emphasis on language in these Indian homes goes counter to some of the widely discussed theories concerning verbal exchanges in the home of poor and/or rural people. In the literature on class differences in language use (for a review and critique, see Leacock, 1971), the nature of mother-child verbal interaction is stressed, especially in giving directions. Working class exchanges are characterized as 'restricted code,' with direct exchanges such as 'do this,' or 'put it in this way' and no explanation. Middle class exchanges are characterized as 'elaborated code,' directions with explanation, and in general, an emphasis on answering children's why questions at length. In all of the verbal teaching reported in the interviews, whether occurring now or fifty years ago (when many more Pueblo people were very poor, and thus in Anglo eyes 'lower class'), the people rely heavily on elaborate explanation and seem to take very seriously the necessity of children understanding the reasons for a procedure.

In their childhood recollections, Indian teachers mentioned many situations where they were verbally taught by their relatives in addition to being able to watch them at work. In cooking, the two processes were clearly intertwined; one woman describes the verbal exchanges with her daughter which illustrates the mixture of modes:

> I told her, you forgot to put in your baking powder. And she said, how do you know? Because the bread is too hard and it won't rise. It was so dry and it is kind of shiny, that is how you can tell if you don't have baking powder. Then she said, she did put in some, but maybe she didn't put in enough of the baking powder. So I make sure every time that she is going to make tortillas, I tell her to put in just enough lard and the baking powder and she makes the best tortillas. She makes better than I do.
>
> ...
>
> Talking about frying eggs, I have two brothers and one day my grandfather was teaching them, while he was watching them one morning, they were frying eggs too and my grandfather said, no, that isn't how you fry eggs. He said, don't break your egg close to the frying pan, you are going to burn your hand, you have to do it way up here like this.

Among active teaching processes, then, are verbal instruction and explanation. But verbal instruction in this context, unlike the classroom context, is always accompanied by observation, demonstration, and/or the child's imitation of the process; verbal instruction also often takes the form of explanation of the reason for the technique or procedure. Some Pueblo people continue to rely on this close connection between speech and activity, at least in connection with certain types of learning. Thus, a Pueblo woman in her early 40s describes a crafts class:

> The oldest person, the old man was a very elderly man and he was very gifted. He could do just about any crafts and he did it very well but he did not stand there and lecture. He'd just show people and if we had any questions, you'd ask. And a lot of times some of the other craft people felt that he should explain more. I got along very well with him because I would sit down next to him and I would talk to him. And he was willing to help but it was very different. He didn't stand up at the blackboard for a long time.

Clearly, in the Pueblo home, it is while work is ongoing that learning is most often communicated through speech. The link between words and deeds as a powerful process is captured by Bruner in his introduction to Vygotsky's Thought and Language (1962): "Man, if you will, is shaped by the tools and instruments he comes to use, and neither the mind nor the hand alone can amount to much" (p. vi). The special role of human dialogue in uniting the separate processes of verbal and non-verbal growth is a major theme in Vygotsky's book; Bruner summarizes it in the following way: "For it is the internalization of overt action that makes thought, and particularly the internalization of external dialogue that brings the powerful tool of language to bear on the stream of thought" (p. vii).

The many examples of verbal dialogue and explanation in these Indian homes as described by those we interviewed presents us with a different style of interaction than that which has been observed in middle-class homes. In the latter, language is exchanged as isolated from activities, it is frequently context-free. Thus it resembles more closely the exchanges which occur between teachers and children in classrooms. Contemporary educators have criticized the purely verbal method of teaching, indeed many schools are moving in the direction of linking more closely word and deed, and word and image, in the course of instruction. These developments necessitate the reexamination of the issues of verbal learning and teaching.

The material collected in this study seems to indicate that a simple dichotomy of learning environments according to class membership or economic level of the family might be fallacious; the cultural emphasis upon verbal explanations in the Pueblo community raises the question of whether a multiplicity of environmental factors might, indeed, affect the nature, functions and styles of language development in children.

The process of how, and to what extent language is used for communication, and the more difficult issue of how language is used as a system of symbolic representation is basic to both our theoretical explorations, and to the data we gathered in this study. One insight we gained in the course of this exploration was the recognition that while in urban nuclear families the strong emphasis upon mother-child verbal interaction as a major factor in the development of language functions may be warranted, in integrated small communities, such as the Pueblos, a multiplicity of interactions are open to children. Grandparents, and other relatives, even neighbors, participate extensively in the patterning of experiences for young children. They, too, become partners in activities and verbal exchanges with the very young.

The support for language development in the course of a child's life is an important component of total cognitive development. As schools are of particular significance in extending children's reliance upon words as a cognitive tool, the way in which home and educational experiences intermesh frequently affects a child's proficiency in the use of language.

While the verbally enriched and supportive environment of the Pueblo child is mirrored in some day schools situated on Pueblo land, other schools outside of the community present the child with an alien atmosphere. In the day schools there is frequently a close working relationship between parents and teachers; the children are vocal, and their classrooms support and extend many of their culturally familiar styles of learning. But when these same children are transported to a school outside the community which supports neither their positive feelings about themselves as Indians, nor their language, the students undergo a profound change. Almost overnight they become sullen and silent, they begin "falling behind." In other words, they become the prototype Indian child in the classroom described in so many research reports.

In light of these different aspects of schooling of Indians, it becomes important to examine not only the over-all effects of education upon children but the particular features of schools and their influence upon cognitive development. To some extent, our observational methods to be described later, are a step in the direction of clarifying these kinds of relationships.

F. Learning Styles: A Second Look

The point of departure of this study was the significance of a style of learning and conceptualization in Pueblo communities based upon observations and a visually potent reality. We viewed the problem as one of defining more clearly what visual learning was and how it related to socialization in the Pueblo environment. Alfonso Ortiz (1969) gives many examples of a "people's picture of the way things are." The significance of directions in the myths, the crucial role of colors and paintings are but two examples, described by him, of a recurrent theme concerning the potency of things visual in these communities.

We searched for evidence of a visual learning style in our contacts with Pueblo children, and, of course, we found it, just as it was reported in previous literature. This example from Havighurst, Gunther and Pratt (1946) is typical:

> The children of Indian tribes which have kept close touch with the world of nature and with their indigenous cultures are specially stimulated to observe accurately, to organize their observations and express them aesthetically... White children, and urban white children especially, may have much less chance to form

> concepts from firsthand observation, but must rely more upon books and words (p. 61).

In addition to findings which support the above argument, we also found in these Pueblo communities a method of teaching and learning rooted in verbal explanation and supportive of verbal conceptualizations. Indian adults described a variety of examples of play as they imperceptibly shifted into socially valued work, as one of the ways in which learning takes place in their communities. While we were trying to become more familiar with the particulars of what we believed to be a specific and dominant style of learning, we found that our ideas, our point of departure were changing. The power and precision of the language of Pueblo adults was echoed by the language of the young children. They were not confined to a single medium of expression; they were verbal and visual, and they delighted in climbing, jumping and helping their elders in varied, and at times strenuous motor activity. But, as we mentioned above, in later years, many of them became the 'silent' Indian children of both scholarly and popular report. Alfonso Ortiz (1972) sums up the situation: "At the very least we may assume that, while the parents do their job, the schools do not; indeed, the schools actually negate the parents' initial success in presenting a normal, well-adjusted six-year-old to the school" (p. 82).

The complexity of these impressions forced us to modify our initial inquiry in a variety of ways. This chapter has been devoted to examining a more fruitful way of conceptualizing styles of learning; we have attempted to make a beginning in the direction of a descriptive model of functional learning systems. The next chapter will outline the factors in the social environment of Pueblo children which are likely to affect their cognitive development, together with some discussion of how differences in environment might result in different functional systems, or strategies for dealing with the world, including the world of the classroom. In the third chapter, we examine a variety of data collected in Pueblo classrooms, Albuquerque classrooms, and from Indian and non-Indian adults. None of the methods we used were intended to tap specific, one-dimensional skills, but rather the variety of strategies that children and adults use in the accomplishment of tasks. The major thrust is to begin to interrelate strategies which form functional learning systems, in our own understanding. This beginning should lead toward the goal of describing and understanding children wholistically as people who have, at age six (for instance), already developed significant strategies for coping with the world. These functional learning systems, or strategies can and should be fully encouraged in the classroom both for the learning of substantive material and for the learning of new strategies which would not replace but augment and be integrated with the existing ones.

Our findings are preliminary, but our gratitude to those who have shared with us their insights into the learning processes of their young ones is enormous.

With their help we may have succeeded in broadening a little the general inquiry into cognitive development as it is fashioned through daily life.

Chapter II

The Settings

A. Pueblo Communities

1. The Pueblos in Contemporary America

For several generations, Anglo-Americans have been drawn to the Southwest because of the large Native American population still involved in traditional life styles. Anthropologists, tourists, and seekers alike have long been fascinated with the existence of these very different cultures within the borders of the United States. The persistence of the Navajo culture has not been considered particularly problematic, in view of the terrain in which they live and their isolation (no one else wanted the land anyway), and the fact that the Navajos are the largest Indian group in the United States (population approximately 136,000). The Pueblo Indians, on the other hand, present an enigma to scholars and other interested people. It seems that the traditional culture has remained largely intact since the Pueblos were first invaded by Coronado's expedition in 1540, despite proximity to and interaction with Spanish and later Anglo peoples. The Pueblos that exist today were for the most part in existence at that time, in the same places (Dozier 1966). Moreover, the economic base has remained the same -- subsistence farming -- for the 400 years since contact (at least up to about the 1940s). The native languages are still being learned and the native religions are still being practiced. Yet, there are twenty-one Pueblos with a total population of only about 35,000. And each Pueblo is culturally different from the next, as any Pueblo Indian is quick to point out; sometimes very different. This persistence of Native American cultures in the midst of the modern world is drawing more interest now than ever before. Alfonso Ortiz, in a 1974 speech, speculated that the Pueblos (and the Navajo, to a degree) would replace the Plains Indians as a romantic symbol in American life. Native American movements and organizations, both radical and moderate, seem to be looking more and more to the Southwest for support and inspiration. Thus, the Pueblo peoples are considered by others to be the most conservative (i.e., non-acculturated) groups of Indians in the United States.

In order to place this study of Pueblo children in a reasonable perspective, we need to examine what exactly 'conservative' or 'traditional' means in this case. In the following discussion, we need not consider the two largest Pueblo groups, the Hopi of Arizona and the Zuni of western New Mexico. These two groups have in general been studied more than the others; they are also geographically distant from the Rio Grande Pueblos; and they each represent different language families, different from each other and from the Rio Grande Pueblos. Concomitant cultural differences are also present, although Zuni exhibits some commonalities with the Western Keresan Pueblos, and has a long history of interrelationship with the Pueblo of Laguna in particular.

The population that we are including in this broader discussion includes nineteen Pueblos and 22,440 people (Bodine 1972). They are divided into two linguistic families: Keresan and Tanoan. Cultural differences, for example, in kinship organization and ceremonial organization exist between these two groups. The Keresan Pueblos are usually divided into Western Keresan (Acoma and Laguna) and Eastern Keresan (Santo Domingo, San Felipe, Cochiti, Santa Ana and Zia). Acoma and Laguna are located about 60 miles west of the Rio Grande River; all the others, including the Tanoan Pueblos, are located on the Rio Grande or within 20 miles of it, with the exception of Jemez, which is situated about 40 miles west of the river, but north of Acoma and Laguna. The Tanoan Pueblos are also divided into different groups, according to the languages they speak and degree of relatedness they feel with each other. The two northernmost Pueblos are the Northern Tiwa Pueblos of Taos and Picuris. The two southernmost groups are the Southern Tiwa Pueblos of Isleta and Sandia. In between these, from north to south are the Tewa Pueblos of San Juan, Santa Clara, Nambe, Pojoaque, San Ildefonso and Tesuque. Jemez, the sole Towa Pueblo, is located west of this group. The population figures for these Pueblos (for the year 1968) range from 4,763 for Laguna to 60 for Pojoaque (Bodine 1972).

In the course of our research, we have worked with people from many of the 19 Pueblos, and therefore the discussion will deal with all of them. Our work in classrooms with children was conducted mostly in two of the Tanoan Pueblos and one of the Keresan ones; whenever pertinent, therefore, we will be more specific about the conditions in these particular Pueblos.

Dozier (1961) considers the Rio Grande Pueblos to represent a cultural condition or type which he calls 'compartmentalized,' meaning that there are at least two distinct and separate traditions being maintained. One is the native, indigenous tradition, and the other the Spanish-Catholic tradition; however, the latter is definitely being rapidly replaced, or rather aspects of it are being replaced, with an Anglo-American orientation. The historical explanation for this state of affairs lies in the attempts by the Spanish to eradicate Pueblo culture; the Pueblo reaction to this was to go underground. Thus, the Pueblos became nominally Catholic, took on other Spanish customs as well, but carried on their native beliefs and traditions in secrecy. Eventually, both traditions became intrinsic and fully traditional. When Americans arrived they also attempted to eradicate native traditions and even native languages; that this was not immediately successful was probably due to the Indians' centuries of experience in keeping native traditions separate and 'underground.' The difficulties that anthropologists and other researchers have encountered in attempting to work in the Pueblos thus is not necessarily due to the 'suspicious nature' of the Pueblo people or conscious and deliberate decisions on their part to withhold information; the secrecy has been a part of native tradition for centuries, and so is thoroughly ingrained in the individual throughout his life (Dozier 1964).

In 1961, Dozier discussed the radical change from subsistence farming to dependence on wage work which has taken place in the Pueblos since World War II. But he points out that these "economic changes, plus frequent absenteeism and increasing contacts with non-Indian populations, have affected Pueblo culture profoundly, yet, surprisingly, these changes have not totally disrupted Pueblo community life and much of Pueblo culture still goes on underneath an external surface of modernism" (p. 92). Dozier, himself a Pueblo Indian, believed that the essentials of Pueblo culture would continue to exist for some time to come. He summarized his discussion as follows:

> Yet despite surface changes, the basic outlines of traditional sociopolitical and ceremonial organization...remain. Although there is a tendency to construct nuclear family house units, interaction on the basis of the larger extended family units continues. English is an important second language, but the native idioms have not been abandoned. Ceremonies still go on, and while membership in the esoteric associations has perhaps diminished, these associations have not disappeared. The persistence of these traditional Pueblo social and cultural patterns indicates the continuity of Southwestern Pueblo cultures as unique segments of the American cultural scene for a long time to come (p. 92).

In a later publication (1970), Dozier points out that the Pueblos appear to be in a period of religious revivalism, that in many Pueblos ceremonies long dormant have been reenacted in recent years.

Several other types of readily visible events have taken place in the past three or four years which certainly point to Pueblo persistence rather than disappearance. One of the Keresan Pueblos, which had become almost completely abandoned as a year-round village, has seen people moving back into the Pueblo on a permanent basis. In 1973, the smallest Pueblo, Pojoaque, elected a Pueblo secular governor and council for the first time in some two decades. Government programs such as Headstart, HUD construction projects, health care and BIA educational projects have made it possible for many educated Pueblo people to move back to their native Pueblos. The recent emphasis on Indian self-determination has spurred new projects on the part of larger organizations such as the Eight Northern Pueblos and the All-Indian Pueblo Council. The recent popularity of Southwestern Indian silver and turquoise jewelry has on the one hand spurred the economy, and on the other consolidated Indians in attempts to preserve authenticity and quality in such products -- economic cooperation on a large scale is again in evidence, at least with respect to the marketing of jewelry and other crafts.

Alongside these signs of cultural and village revival, there are strong signs of extremely drastic changes taking place in the past ten years, affecting all the Pueblos. Anglo-American society has affected the Pueblos differentially over the past fifty years;

there is some literature on the differing degrees of 'conservatism' and 'acculturation' in the Pueblos (Bodine 1972). However, there is evidence that some of the factors which have been influencing 'acculturation' for a long time are now leading to greatly accelerated changes.

Spicer (1962) considered crucial to persistence of the culture the maintenance of the socioeconomic base with the addition of wage work as a not necessarily disruptive force; and the endurance of the extended family system. Dozier (1961, 1970) agrees with this, but also emphasizes the degree of integrity maintained in the sociopolitical and ceremonial organization, the persistence of the indigenous languages, and the processes of early socialization, which he considered relatively undisturbed by outside influence. Today, changes in all of these areas of life are evident.

Subsistence farming is no longer feasible as a livelihood for anyone in the Pueblos. Farming continues, but it is clearly not as important as even fifteen years ago. To seriously consider farming as one's main support means something different to Pueblo Indians today. A young Pueblo father puts it this way:

> I often thought that if he /his son/ were real serious about wanting to be a farmer and if it were a little earlier in our history where you could farm and have a pretty decent chance of making a living without being a great big farmer I wouldn't mind buying a farm somewhere in farming country, say, and letting him do something like that. (You can't do much here?) ... Well, you can do, but I'm talking about if a person wants to be a farmer for a living that's not the way to go. You go to farming country.

Clearly, farming today is only carried out 'on the side,' and not by everyone. Along with the decline in farming goes decline in associated activities, some of which are of obvious value in the integration of the social life of the community. One of these activities is ditch-cleaning, which used to be a communal effort, a large annual event in the life of each Pueblo. Another realm which must obviously be affected, although outsiders can't know much about it, are the ceremonial activities associated with the growing of crops. Thus, seemingly, Spicer's first factor crucial to maintenance of the old tradition is already non-existent.

The extended family, on the other hand, seems to be still thriving, at least in some respects. It is true, as Bodine (1972) has written, that the tendency is toward nuclear family housing; however, as long as residence is within the Pueblo, children certainly are 'raised' by many different relatives, not only the parents. Frequently, even in the case where people live in towns, and out of the state, children are sent to the Pueblo to live with grandparents, aunts, etc. Moreover, economic cooperation within the extended family is widespread. This is also the group that cooperates in house building (occasionally this is still carried out without the help of HUD) and in ditch cleaning. It is evident that for the majority of Pueblo people, daily interaction and/or other forms of communication and cooperation with a host of relatives is the way of life today. Even marriage outside the Pueblo, which is 'disruptive' in other ways (see below), does not seem to seriously affect the extended family, at least not as long as the spouse is Indian. The other family is simply in some way or other incorporated into the kin cooperative network. The changes in the extended family system seem to be relatively minor ones, such as cooperation on a different basis than formerly, and perhaps less frequent day-to-day contact. The commitment to the system, the feelings for 'family' are certainly extremely strong. Thus, D'Arcy McNickle (1972) speaks of the Pueblos as well as other Indians when he says "...the tribal-traditional Indian did not renounce the loyalties and obligations that attach to the kinship universe--that consciousness remained with him" (p. 15).

Dozier's (1961) dual emphases of integrity in sociopolitical and ceremonial organization, and early socialization have in common at least one crucial factor that needs to be discussed, and that factor is language. Although we do not know much about the traditional sociopolitical and ceremonial organization in the Pueblos, nor the degree to which these are maintained in the different communities, we do know that they depend on native language maintenance. That language is inextricably tied to religion in the Pueblos is aptly illustrated by the difficulties of linguists in obtaining any data. The absolute refusal is explained by: "If you learn our language, you will also learn our secrets." In those Pueblos where the native language is strongest, care is taken that no non-Indian gets a chance to hear enough of the language to learn it. Thus, children from these Pueblos who come to kindergarten freely speaking to each other in their native language will, by about second or third grade, have learned not to do so in front of non-Indians. Certainly, encouragement to speak as much English as possible in school has something to do with it, but mainly it is prohibition by the elders of the Pueblo that is responsible. (We are now talking of only three or four of the Pueblos.)

That the native language situation is changing drastically is best illustrated by reports of teachers who have taught in the Pueblos for some time. (It is impossible to conduct statistical surveys, especially about language, which tends to be an extremely emotional topic in all the Pueblos. The only 'testing' done on bilingualism has been in conjunction with various recent bilingual programs, but such data are sporadic, unreliable and inaccessible.) In some Pueblos, language loss is visible even to casual visitors. Thus, one might find that not a single kindergartener speaks the native language, although some may understand it; in first grade, one or two speak it; in second, a few more speak it; and on to sixth grade, where perhaps half the class either speaks or at least understands it very well. In other Pueblos, the situation is less clear-cut. One might find that about half the children in a school do not speak the native language, and that this has been the situation in their families for some time; the other half consists of children whose families have maintained the language, but each child may know it to a different degree, depending on who has been his/her main caretaker over the years. In such Pueblos, obviously, the true language maintenance situation is impossible to ascertain without specific data.

One type of teacher report that recurs is to the effect that while five or six years ago children came to school not speaking English, now they attend Head Start from age three onwards, and thus are not, happily, ignorant of English at the start of school. Indian aides report this as well, but they have more mixed feelings about it, since they feel that the children sometimes also know less of their native language. One Indian Head Start teacher, who only five years ago prided herself on the teaching of English is now instead emphasizing the native language -- the children entering school do not know it well. Again, it is not possible for us to assess effects of such programs as Head Start, but one can't help wondering whether these types of effects on language maintenance are not more drastic and complex than anyone has anticipated.

In Chapter I, we discussed the place of language in socialization and in Pueblo life in general. The vital importance of language to the Pueblos themselves is also illustrated, in some cases, by a sort of 'panic' reaction: the sudden realization that children don't know the language has led to several Pueblos introducing bilingual programs into the schools -- hiring those very same linguists to whom they previously refused information as consultants. (By 'refusal' we meant official attitudes. Enterprising linguists can always find people who feel differently, and they have.) In other Pueblos, where official bilingual programs are out of the question at present -- these are usually the ones where most children still learn their native language -- bilingualism is allowed and even encouraged in the classroom by Pueblo elders, especially since so many native Pueblo aides are now working in the schools. There are restrictions, to be sure -- for example, forbidding the writing of the native language -- but there is recognition that perhaps the children will be more successful at being bilingual and bicultural individuals if the schools are also bilingual and bicultural.

The possibility that the second type of Pueblo discussed above has the right idea when it comes to language maintenance is illustrated by a quote from an interview with a woman from a Pueblo of the first type:

> The thing that happened when the Indian children started going to school, the reliance went from the mind to the book, you know, and they start relying on the written word. And it has happened to us and that is one of the reasons why the language is fading, because there is more reliance on the written word than there is on the oral tradition. That's one of my pet peeves, too, is that they are teaching Indian language in the written tradition and it's not going to survive.

The 'written word' mentioned in the quote refers to both English and the native language. And despite the truths in the statement, universally, language loss occurs when the language is not spoken in the home any longer. The reasons for this are varied; partly it is pressure from the English-speaking school, of course.

Again, universally, parents who themselves have had to struggle with subject matter in a foreign language want to spare their children such traumas. However, another very obvious factor in the Pueblos is and has always been intermarriage. Now that everyone does know English, young people who marry other Indians speak English with each other rather than learning one or the other's language. Bodine (1972) has made an excellent compilation of data on intermarriage with both Indians and non-Indians. Although he does not present any data on language maintenance, or even discuss it much, it is possible to scan the tables and see that those Pueblos with the highest incidence of marriage outside the Pueblo are also those where the language is least maintained. This was noticable in some of our interviews: three interviews were conducted with people from one of the 'high incidence of intermarriage' Pueblos. One woman in her forties knew the language well. A woman in her seventies, however, did not. The man, who was in his forties also, did not know the language at all; he estimated that 30% of people his age were in this position. In contrast, in those Pueblos where the incidence of intermarriage is lowest, it is probable that 30% of people in this age group have a minimal knowledge of English, while all know their native language.

It is clear that the Pueblo traditional way of life is changing and that all Pueblo people are consciously trying to work out a way of life which will enable them to remain Pueblo Indians while taking part in the socioeconomic structure of the broader society. Those Pueblos which are most traditional are examining the processes that have led to loss of traditions in others; and the others are looking for ways to prevent further loss. Perhaps their chances of success are good precisely because of this self-consciousness and because they have more control over their lives than most other Native American peoples. As D'Arcy McNickle says: "The environment of the Pueblo peoples was not created for them by members of the majority culture, as the environments of most reservations are created. Rather, a culture in its historical ecological setting has been hemmed in by the majority culture" (1972, p. 19). We have seen that at least one aspect of socialization is changing -- namely that of language. For our study, the socialization of children is of crucial interest; therefore, we need to take a closer look at other aspects of it as well.

2. Socialization, Identity and Learning at Home

> At each home they /Pueblo masked authority figures/ assure the women that if their children misbehave /they/ may be summoned by a tap on the fireplace chimney, and they will return to carry the children off to their homes in the labyrinths of the sacred hills. Particularly mischievous youngsters may be brought out and whipped, then left with the promise that they will be eaten if they misbehave again. (Ortiz 1969, p. 76)

This quote illustrates the view of Pueblo socialization generally expressed in the anthropological literature. The emphasis is on the severity of punishment and the restrictions placed on children and also adults to 'keep them in line.' The discussion of socialization is almost always in terms of the threats used by adults to children -- threats having to do with supernatural figures whipping bad children and carrying them away.

The other factor mentioned in socialization is the host of relatives involved. Interestingly, the true day-to-day relations between children and their elders is rarely described. Most likely this situation is due to the interest in norms and ritual rather than everyday behavior on the part of early anthropologists.

In our interviews with Pueblo adults about their own socialization and that of their children, we seem to have obtained a picture of the 'other side of the coin.' In their descriptions of learning as young children, the interviewees always tied their experiences in with particular people, most often relatives. Deep respect for elders permeated all the interviews, and was seen as a value both naturally absorbed by and actively taught to children. They rarely mentioned punishment or pressure to perform. The quality of relationships with elders was seen as influencing the course of life, especially as it related to their identity as Indians. They felt that the basis for their success as bicultural individuals went back to the sense of belonging that their elders were able to give them in childhood. The only hint we ever obtained that anything akin to the kinds of threats described above exist was the report by an observer about a story told in a Head Start class. The Indian teacher told the children a tale about the traditional supernatural authority figures and how they threatened some children -- the story ended well, with the children back in their homes.

In the interviews that we conducted we did not probe about punishments and threats, nor would we expect the people interviewed to spontaneously describe such. They were for the most part well-integrated members of Pueblo communities, and therefore, did not talk about religious aspects of their lives, nor would we expect them to talk freely about aspects they knew would be seen as negative by non-Indians. However, the picture we obtained about children's upbringing, although perhaps not the total one, explained much of what we see of children in Pueblo classrooms.

As we mentioned above, the people interviewed always tied their experiences in with particular people, most often relatives. Although occasionally they do describe learning from older children, their most significant models were people one or two generations older than themselves. Often, one or two people were seen as having influenced the entire course of life for the interviewee. All the people interviewed mentioned respect for elders as one of the very strong values they were taught as children.

The respect people have for their elders does not rest on fear, but rather on reverence for the vast knowledge that elders have and on love. A woman described her relationship with her grandfather very poignantly:

> A child is taught how to respect elders right from the beginning, because I remember when I was little my grandpa came home from the fields and he is tired and he needs a drink and he sits down. He sits down and says, boy, am I thirsty, I sure need a drink of water. And my grandmother would tell me, your grandfather is thirsty. ... If [the water in the pottery jar] is way down then I'll run to the pump. ... Your stand there and pump, pump until the water comes out cold. I'd give him this water. Now pretend that you are my grandfather and if I gave you the water, I couldn't sit down and watch him drink, that would be very impolite. So I give you the water and stand there and I wait for you to drink your water, then I take the cup and put it back. That is one way of showing your parents respect, so you were taught at a very early age respect to your elders. I guess it just really grows into you that whenever... a lot of times I bring him water and there is someone outside for me to play, I want to go play. But then he is my grandpa and he is the source of my Indian stories and whenever I come to him, no matter how tired he is, if I need an Indian story he never tells me go out and play with your friend. He is ready for a story for me and it bothers me to think that I want to run out there to play and leave him here drinking his water and I want to show him that I care.

People remembered all elders of the community as kind and generous, not only their own relatives. Special treats were sometimes prepared for any children that came along as part of everyday activities, as in the following description:

> It is always a treat when Indian women are doing

> their pottery. A lot of children, not only me, when my grandmother was making her pottery, I'm not the only one, there were other children from the village that would come when my grandmother was making pottery and she would take an ear of corn and make Indian popcorn in the ashes, and when she finished that, she would say, go ahead, take your popcorn. That was a treat. I think all Indian mothers were like that when they were firing pottery, and someone else's children came. Even if she didn't have any children, she knew what the kids were expecting.

Most of the time, close elders were remembered as non-punishing, even when they were in the crucial role of bringing up the child. Thus, a man remembered his grandmother:

> I lived with my grandmother for a number of years in my earlier days and she really thought those were the acceptable ways and she made me know it, not necessarily from spanking me and getting after me. But she was always reinforcing them positively by talking about some kid who knew his manners and stuff like that ...
>
> Fortunately I remember my grandmother reinforcing things more than I remember being punished for not knowing how to do something. I seem to feel that this has been my basis for having had a chance to be some kind of success, at least a little bit in my own way. I feel and I often think of the positive that has resulted from my upbringing from my grandma. I feel that this kind of extended with other things later on in my life, my aunts and my own mother. The emphasis was not necessarily like I faced it in the White world, early years in school, being scolded and this and that. It sticks to me more, the positive things of life, I think.

And a woman remembered her grandfather:

> My grandpa, I don't remember being punished by my grandpa. I always had that feeling, my grandmother was little, she was small and I didn't feel right

> to climb on her lap, to sit on her lap. But my grandpa was big and whenever I needed to cuddle up, I would climb on his lap.

But even when punishment was remembered, it was softened by obvious love and warmth, as in the same woman's description of this episode:

> I remember getting punished by my grandmother, I don't know what I did, but I must have done something. My grandpa had a little stool, we didn't have tables to eat on, we all ate on the floor and my grandpa had a little stool with a cushion on it and he used that one to sit on when he ate on the floor. That was a nice little stool to sit on, so she brought me in from outside, she brought me by the shoulder and put me down. It was right by the door, it was a little corner, and she put that stool down and she told me to sit there and told me not to move. In English you would say, don't you move from there. But her way of saying it was, I just want your eyeballs moving and nothing else to move. After a while she needed an errand, she wanted me to go somewhere and do something, she called me. And I said, I can't, Grandma, remember, you just wanted me to have my eyeballs move, I can't move my feet. I must have been some sort of a parrot. She just laughed. Many a time I say something and she would just start laughing.

The quality of relationships with elders, as mentioned above, was seen as influencing the course of life. One man related this type of experience explicitly to his identity as an Indian.

> It kind of gives you a place, of all the things they tell you, a place of belonging, where you come from, where home is, things like that. I think an Indian child is very much at home. He knows where he's going, he knows where he comes from. I think that has a lot to do with being proud of who you are. That has always been some-

> thing that has been very strong in... As far as I can remember, my grandfathers and my father and my mother and my grandmother have been the people who were very influential at this time and I guess if I was from the Anglo society it would be what the people call a real blue blood...

This sense of continuity within a tradition, that one's life is unique but also connected in very important ways to lives that have gone before can be sensed in all of the interviews.

In contemporary society, many traditional teaching functions of the family have become institutionalized, not only in the schools, but in other settings such as 4-H clubs, church schools, television, and so on. In these interviews, the evidence is conflicting as to how much diffusion of teaching-learning activities has taken place in Pueblo communities. For instance, 4-H clubs and scouting were mentioned as activities children today take part in; on the other hand, there were many descriptions of children learning construction, farming, cooking, nature and crafts the same way that the interviewees themselves did. Thus it seems that adult Pueblo people as parents and grandparents still are deeply involved in teaching the children by demonstration as well as by verbal explanation some of the skills they themselves learned and value. Certainly, Pueblo children display a high amount of self-confidence and sense of identity as Indians at an early age, characteristics which most likely can be related to growing up in an integrated community which explicitly and actively is teaching

Indian traditions. It appears, then, that learning and teaching in the home still covers a much broader range of life than may be the case in most non-Indian homes in America.

The impact of Pueblo socialization on Pueblo personality and approach to life can perhaps be related to McNickle's (1972) discussion of Edward M. Bruner's statement which McNickle quotes: "That which is learned and internalized in infancy and early childhood is most resistant to change in contact situations" (p. 16).

> In support of his thesis Bruner points out that kinship terms and related behavior, also the values and the roles operating in a society that are learned in the first years of life, often in the intimate relationship of mother and child, persist long after social groupings, such as age-grade societies, rituals, residence patterns, clan affiliations and other characteristics of a people have either vanished or exist only tenuously. The traits or practices that lose ground are those that are learned in late childhood, or still later, and in a less intimate setting (p. 16).

The 'intimate setting' for the Pueblo child is not just the home, but all of his/her relatives' homes, and to a large extent the total Pueblo community.

3. School and Community

During our work in the Pueblos, it became clear that there are differences in the degree to which schools that Pueblo children attend are integrated into the community. First, we can say that B.I.A. Day Schools are in general much more integrated into community life than are public schools. Usually B.I.A. schools are physically located in the Pueblo itself; in the three schools at which we did most of our work they are situated next door to Pueblo dwellings. In other Pueblos, they may be set apart from the main concentration of dwellings, but are still within easy walking distance of the majority of houses. In contrast, public schools are usually not located within the Pueblo, and are accessible only by driving some distance.

The actual integration of school and community in those Pueblos where the school is within the Pueblo depends on both school personnel and the community. In the Keresan school where we were working, for instance, all the people who lived in the Pueblo were encouraged to visit and take part in school activities. However, this was a new policy begun by the new principal; some of the teachers and most of the Pueblo people did not as yet take this policy seriously. Thus, during the course of a regular school day, the only community members present at the school were those who worked there (aides, kitchen personnel, custodians). Nevertheless, the presence of large numbers of Pueblo people as employees gave the school a definite flavor of being a part of the community. In all these types of Pueblo schools, the recent large increase in local Indian personnel has helped in bringing the school and community closer together -- the school is no longer the mysterious, alien non-Indian environment that it was only ten or fifteen years ago.

To illustrate these factors which are tending to bring school and community together in the Pueblos, we want to describe the situation in one of the Tanoan

Pueblos. There, we were very soon struck by the free flow between school and community. We then deliberately tried to look at the inter-connections in the lives of the children, not only observing those variables that we were originally interested in, but trying to see more fully the linkages between home, community and school. Such "linkages" when separately discussed make a lot of sense in the life of the typical American child, but lose some of their significance when looked at from the point of view of the Pueblo, where a kindergarten child can walk home without any necessity of adult supervision, or a parent can come into a classroom at any time and say, "I need to take my child to the clinic" and then bring him back fifteen minutes later, or where a child can go to his own, his grandmother's, or his uncle's home after school without anyone worrying about where he is. The continuous flow of life in and out of the classroom that is totally linked with the flow of life of the Pueblo astonished us even though we thought we were fully prepared for it.

When we say that it doesn't make sense to talk of "linkages" we mean that there is no specific list that we can put down which will tell us what the relationships among home, school and community are. Home is the community is, to a degree, the school. Children who enter kindergarten on the first day do not cry; they do not need their mothers to stay with them, even those who have never been to Head Start. There are some who do not like it at first -- but they don't immediately ask to go home either. One little girl started going around after two months in the school and telling everyone how much she liked it now, while before she hadn't. No one knew that she hadn't liked it (this obviously relates to her own emotional maturity also). Another child, a boy, had been in kindergarten for a month in a Texan city and had cried every day, but said goodbye to his mother with a smile on the first day at the Day School and hasn't cried since. Children come to visit the teacher, who lives behind the school, on weekends to help feed the animals and just to play. Children do go to different houses after school; often signals get mixed up and children are taken to their own home when they were supposed to go somewhere else; but they just stay at home by themselves or go to a neighbor's who may or may not be a relative. Children constantly see each other outside school -- they know each others' families. If there is an important event, children go also -- they are not left out of crucial ceremonies like funerals. When a parent visits the class, all the children who are her relatives or who know her well gather around her and show her everything, not just her own child. Grandparents visit the classroom as well, taking part in activities. In this school, as in others, it is partly the aides who are from the local community who are responsible, directly or indirectly, for the partial integration of school and community. Aides have friendly relationships with many parents -- this enables them to extend frequent invitations to parents to come to school and also makes the parents more at ease about coming. Also, aides know about the home lives of many of the children, and so they can take advantage of this knowledge by ensuring that important events in the lives of the children are not glossed over. Additionally, community members who work in the school in a non-teaching capacity feel closer to what is going on in the classrooms because they know the aides. Deliberate attempts to integrate non-teaching personnel into the work of the classroom occur in the form of including them in workshops concerned with curriculum. From the children's viewpoint particularly, community personnel in the school are not just 'teacher' or 'cook,' or 'custodian.' The teacher might also be several children's aunt; the custodian a highly respected religious leader.

Another recent change in the Pueblos with day schools has been the establishment of locally elected school boards. Such school boards naturally vary in the amount of responsibility they have, or are willing to take on, for the running of the school. In some Pueblos, for instance, the school board interviews all teacher applicants and makes hiring recommendations. In others, the school board may interview the principal's choice and agree or disagree. Similarly, some school boards initiate changes in curriculum and even in the structure of the school, while others simply give their opinion on new curriculum which the principal or the B.I.A. education office wants to introduce. To illustrate the different powers of school boards, in one Pueblo the school principal was permanently dismissed by the school board; in another, the principal was temporarily replaced at the instigation of the board, but is now back at the school. Moreover, power in one area (e.g., personnel) does not necessarily mean power in all other areas. Whatever the political relationship between the B.I.A. school and the school board may be, it is nevertheless evident that since the establishment of elected school boards, the Pueblo communities have become much more knowledgable about their schools, and no longer feel that they are entirely alien institutions imposed by non-Indians.

In conclusion we can say that whatever the case may have been in previous times, today Pueblo elementary schools are a part of the community. This has come about largely through the increasing participation in education on the part of Indians themselves, both as employees and as advisory and sometimes policy making members of school boards.

4. The Pueblo Classrooms

We will here describe each of the three Pueblo schools in which we worked more specifically, both in order to provide actual examples of Pueblo classrooms and in order to enable us later to relate data to the settings in which they were collected.

a) A Tanoan Day School

The B.I.A. maintains a day school (K-6) in the Pueblo. There is also a Head Start program in the

Pueblo, so that many children entering kindergarten at the day school have attended Head Start for a year or longer. In the school, kindergarteners, first graders and second graders have separate rooms, with a teacher and aide in each. Third and fourth graders are combined in one classroom, as are fifth and sixth graders. Each of these groups also has a teacher and an aide. There is a part-time P.E. teacher, a part-time music teacher, a part-time Special Education teacher, as well as a part-time library aide. The teachers and aides are directly responsible to the principal, who in turn is responsible to the Education Director and his assistants in the Northern Pueblos Agency of the B.I.A. The school has an elected school board consisting of community people, which so far has served mainly in an advisory capacity. The Pueblo Governor and Council, however, can and do on occasion act in a decision-making capacity when it comes to school matters. Instruction in the school is carried out entirely in English; the youngest children are almost all monolingual in English.

The kindergarten, where we did most of our work in this school, has a non-Indian teacher and an aide who is from the Pueblo. In this classroom, children are encouraged in both academic work and in self-expression through movement and arts and crafts. The integrity of the adults who run the classroom is evident in the children's exuberance and freedom in relating as people and as Indians to each other, to the teachers and to visitors. Most of the children seem to have a basic comfort about themselves that is rare in five-year-olds. For the most part also the children are self-confident as academic learners. Their approach to learning tasks is usually: "I'll try it." All children use all the available materials, although naturally they do have preferences. The classroom itself is richly ornamented with the children's art work; their academic work (for example, dictated stories, letter and number exercises) is however also displayed. The teacher and aide seize every opportunity they can to bring in community people to work in the classroom. Thus, a child's grandmother might be there for a morning, helping children with whatever work they are doing. Or, a child's aunt might set aside several hours during the week to come in and do pottery with the children, pottery not with store-bought clay but with clay and sand collected by herself. Sometimes the children themselves become community resources, such as the boy who teaches other boys dances that he seems able to learn mainly by watching men do them.

In general, the emphasis in this classroom is on letting the children find their own preferred mode of accomodation to school work, while still making it clear to them what academic work means now and in the future. At the same time, modalities of relating to the world other than the traditional verbal one of the Anglo school are presented and encouraged. The Pueblo tradition is highly valued and brought into the work of the classroom.

b) A Keresan Day School

The kindergarten class has a teacher, an aide and fifteen children. Both the teacher and the Pueblo aide participate in instructing the children. The use of the native language orally is encouraged in this classroom. Most activities are carried out in both English and Keres; the teacher attempts to make sure all concepts are learned in both languages. Keres is also used by the aide in explaining tasks to children who don't understand complex instructions in English. One girl, whose native language is Keres, has also become extraordinarily proficient in the task of translation; the teacher relies on her for necessary translating if the aide is busy or out of the classroom. Most peer group conversation is carried out in Keres, in which the children seem to be very sophisticated. For instance, they have internalized rules of language use in the community which have to do with turn-taking: lunchtime conversations are carried out in extremely orderly fashion, with the listeners giving full attention to the speaker until he is finished. At the beginning of our visits (end of March), the three native English speakers in the class never took part in such conversations. However, at the end of May, the two boys, but not the girl, were attempting whenever possible to say something in Keres during such conversations.

The kindergarten children's day is a mixture of fairly formal lessons and informal play. The teacher and aide do much work in constructing materials for the children which are based on their experiences, such as lessons based on Pueblo designs to teach concepts like same/different etc. In addition, the children take part in music and physical education, for which they go out of the classroom. In terms of visual impact, this classroom most of the time presents an orderly picture with some children's work on the walls. In addition, there is a beautiful set of drawings done by the aide for the purpose of teaching number concepts. These are based on items that the children can relate to such as pottery, drums, native designs, and other things familiar to the children who live in the Pueblo community. On the whole, this kindergarten classroom presents to the children somewhat more direct instruction tasks and less art, crafts and drawing than an average kindergarten. This is intentional, as the goal is to achieve competency in English as well as in Keres, and does show results at the end of the year, in that the children do very well on standardized tests and on informal assessments made up by the teacher herself.

The first grade classroom has a techer, aide, and twenty-two children. The native language is not consciously taught in this classroom, but the aide uses it while working with some children. The children speak both English and Keres to each other, with Keres predominating. Most children freely initiate conversation in English with the teacher and with visitors; to the aides in the school they speak both languages, probably depending on who is present and what the situation is. (For the school as a whole, most informal conversation among children and adult members of the Pueblo are held in Keres;

more formal conversations having to do with school business are held in English.)

In the first grade classroom, much of the instruction is carried out using standard texts and workbooks. Most work is done in small groups; children also join groups in other classrooms and children from other classrooms come in. (The school is using a modified version of the IGE instructional system.) The classroom is not striking visually; there is not much evidence of children's work on the walls, nor of community-based instructional materials. Hoever, projects are undertaken on occasion that relate both to art and to community -- for instance, these children constructed a model of the entire Pueblo which they presented to the Principal for him to display in his office. Although much of the classroom instruction is formal, this is counter balanced by the warmth of the teacher and her acceptance of the children.

c) A Second Tanoan Kindergarten

This classroom has a non-Indian teacher and a Pueblo aide. Instruction is carried out in English; however, the children take part in a bilingual program (oral and written). The native language teacher comes into the classroom on a daily basis to teach small groups (4-6) of children at a time. Of the children in the classroom, one was non-English speaking at the beginning of the school year; all others were monolingual speakers of English, except that one or two understood the native language a little. The native language lessons have resulted in the learning of some vocabulary, but the children do not spontaneously construct sentences in the native language.

The classroom is extremely rich in materials for the children to work with. Children's work is prominently displayed on all walls. The teacher and aide emphasize academic work in the sense of introducing a great deal of it to the children; however, no child is forced to stay for the duration of a formal lesson if he or she loses interest. Several children have learned to read beyond what one might call beginning first grade level. The teacher conducted the story-telling activity for our study herself (see Chapter III); she found the activity extremely useful in encouraging children's verbal expression -- consequently she extended it by later using native Pueblo stories in the same manner. In general, verbal experession was greatly encouraged in this classroom, with the direct result, the teacher felt, of these kindergarten children outscoring the first graders on the English section of the language test administered at the end of the year by the bilingual program personnel.

Indian traditions are supported in this classroom as well. For instance, the children practice Pueblo dances in the classroom; they have costumes that the teacher and aides have made for them. Interestingly enough, while in the other Tanoan kindergarten the dancers were mostly boys being taught by one of their peers, here the dancers are mostly girls taught sometimes by an aide.

It is obvious that the classroom presents a comfortable atmosphere for both children and adults. The children are for the most part not shy of visitors, and display a fair amount of independence in their initiation of activities. Frequently, teachers, aides, and other school personnel come in to visit for a while. Children are very much encouraged to develop their individual approaches to learning, and a very wide variety of activities is presented to them.

B. The Non-Indian Settings

A number of classrooms in Albuquerque and elsewhere were included in the study in order to provide some empirical basis for descriptions of differences in Pueblo children's approaches to learning. These classrooms were not chosen with specific settings in mind. We simply availed ourselves of opportunities to work in classrooms which we knew were very different -- both in terms of children's backgrounds and in terms of the classroom setting itself -- from the Pueblo schools.

1. Albuquerque Public Schools

We were fortunate in obtaining permission from the Albuquerque Public Schools to carry out observations and other activities in the schools. The city of Albuquerque has a population of approximately 300,000; however, the school district includes areas outside the city limits and therefore, the total area population served by it is probably close to half a million people. About 40% of this population is Spanish surnamed. Public schools differ greatly in ethnic composition according to their location in the city. The main line of division is between "the Heights" and "the Valley;" these in turn are divisible into northern and southern areas. The Northeast Heights is predominantly English-speaking and white (Anglo); one of the classrooms described below is located in this area. The Southeast Heights is also predominantly English-speaking and white; however, a relatively large proportion of the city's Black population lives in this area. The North Valley population ranges from well-to-do Anglo to poor Spanish-surnamed (Chicano), with all imaginable combinations in between. One of the classrooms is from this area. The South Valley population is working class Chicano and working class Anglo, with some very poor areas (Chicano and Black) and pockets of well-to-do Anglo. The third classroom is from this area.

a) A Northeast Heights Classroom

This first grade class has a stable population of Anglo children. The community the children come from is a new housing area of upper middle class status. Class size is around twenty-five students. The children at the end of the year ranged in reading ability from end of first grade to around fourth grade. This great diversity among children tended to show up because of the structure of the class. Children are given freedom to do the activities they wish to do with only a minimum of assigned tasks in subject matter areas. There are group activities; many of these focus the children's thinking on a topic and then they are enabled to do many follow-up activities. These often include a variety of arts and crafts along with writing books, and dramatics. Children also draw pictures to illustrate the books they write. Reading, talking, and discussion with others is encouraged. The room is filled with interesting objects, hundreds of pictures and story books, reference books, puppets, games and art materials.

b) A North Valley Kindergarten

This classroom is a Title I kindergarten in a predominantly Chicano neighborhood of Albuquerque. There is one teacher and one aide, with a morning session of sixteen children and an afternoon session of another eighteen children. It is a modified or informal classroom with both teacher and aide initiating and working individually with the children. The teacher is, however, the primary person in terms of responsibility for the classroom and in initiating tasks.

Classroom activities often include art projects; the children's art work decorates the room. The children are free to draw and paint anytime; however, they do not often undertake coloring, drawing or painting on their own. The language spoken by students and adults is English, although on occasion the aide addresses children in Spanish, and most children understand her. Children among themselves speak only English.

c) A South Valley Classroom

The children in this classroom mostly come from working class families. The neighborhood is semi-rural -- some farming is carried out here; most people have gardens and some have domestic animals, mostly horses. The classroom has 67 children from second through sixth grade and two teachers. There is a Title I program in the school, so that two Title I aides occasionally come in to work with small groups of children. There is also a special art project which allows about eight to ten children especially talented in art to go to the art room for special lessons. The two teachers have worked out a system of team-teaching which allows them both to work with all the children in one capacity or another. The classroom setting is informal -- there are tables around the room, there are special areas for music, for cooking, and for woodwork. A two-tiered structure is in one corner, used by the children for socializing, for games and for reading. Small animals are kept in cages in the room, and there is also a terrarium as well as potted plants. Reading and mathematics are taught at definite structured time periods; other subjects (and additional reading and mathematics) are taught mainly through small-group projects. The teachers are dedicated to an individualized approach, and therefore try to work with each child's strengths, weaknesses, and interests in a personalized manner. Arts and crafts are encouraged along with academic subjects for all children. There is a very wide range in skills and abilities in the classroom -- for instance, reading level ranges from about fourth grade ability on the part of a second grader to primer level on the part of a sixth grader., aside from those who are reading at grade level.

2. A New Mexico Summer School

Another site was a summer school for children who had completed kindergarten or first grade the previous school year. This school was located in a New Mexico community with an extremely large proportion of professional people, and the fathers and some mothers of at least 70% of the children are professionals, including a doctor, a dentist, and several Ph[illegible]. The schools in this community are extremely academically oriented. Whenever school statistics are compiled about New Mexico, for instance, this school district tends to "top" all others -- in scores on standardized tests as well as funds spent per child and availability of 'enrichment' programs. The community is probably unique in the country in being a small town not close to a large city (95 miles from Albuquerque), yet consisting of mainly upper-middle class professional people.

3. A New Mexico Commune School

The third site was a school in a commune located east of Albuquerque in the mountains. All but two of the children, however, were children from the surrounding area, some of them children of counter-culture parents, some members of rural families of a more traditional kind. Although some of these children's parents came from upper middle class and middle class families, none are now engaged in professional occupations. The school's philosophy stresses self-motivation, personal freedom and the absence of traditional role and authority structures.

Approximately 40 elementary age children attend the school. Classes are not compulsory, but all of the traditional subjects as well as numerous supplementary topics are offered and appear to be well-attended. In adult and student relationships, the school tries to stress equality and mutual respect rather than traditional status roles.

4. A San Diego Classroom

The elementary school we worked in in San Diego is located downtown. It is surrounded by low income, predominantly Black and Chicano neighborhoods. Federal funding comes to the school for low income children for special programs and food.

The classroom we worked in was a combined grades 1 - 3 room. There were 23 children and two teachers (this classroom was taking part in a special project). The teachers were Anglo, but one was bilingual in Spanish and English. Half of the children were Chicano, half Black; two of the Chicano children spoke very little English. All the children came from the surrounding highly urbanized neighborhoods. Language development and reading were highly emphasized, although plenty of other activities were available for the children. The room was organized in terms of learning centers, which were changed from time to time, in order to provide access to a wide variety of materials. Part of the day was taken up with structured time in reading and math, part was 'free time.'

Chapter III

Process Measures: Methodology and Results

A. Introduction

In this study we were interested in exploring intellectual consequences of children growing up in differing learning environments. As described in Chapter I, we hypothesized that the opportunities to observe adults at work may be conducive to a more visually potent method of learning on the part of children than the reliance upon verbal dialogue between adults and children, while the preponderance of this latter method of learning is conducive to rapid acquisition of verbal skills.

The methods we have chosen for examining these hypotheses are drawn from the recurrent activities of children in their homes and in their classrooms. For instance, we wanted to find a task which makes use of children's visualization processes. We observed that in many different classrooms, children took great pleasure in playing with small blocks. The Block Construction task (to be described below), is an outcome of that observation: a visualization measure was constructed based upon recurrent activities of children. A second index of visual memory and representation was developed by us in connection with the Story Retelling task. Although most children like to draw, when asked to draw at a particular time, they often hesitate -- unsure about a suitable topic or theme. After a story which has large and vivid illustrations had been read to them, we found that young children were able to make a drawing without hesitation. Both these tasks were thus based on activities that children engage in naturally on their own. The verbal part of the Story Retelling and Drawing task was intended to tap processes used in verbal representation.

In addition to the Block Construction and Story Retelling and Drawing tasks, a third task was used to tap children's verbal and imaginal processes. This was the traditional Word Association task, which we administered both to children and adults. Our objective was to discover what, if any, cultural differences would emerge. In addition, as an extension of this task, we used direct elicitation of visual imagery.

Supplemental to tasks administered to children, we have also developed a standardized interview form for gathering systematic data about learning experiences of Indian adults. Additionally, non-Indian adults were asked to describe their methods of studying, memorizing, retrieving information and developing new ideas by using standardized questions as a guide in writing self-reports. Lastly, we collected observational data of classroom interactions in various group settings. As we were not able to spend as much time in Pueblo classrooms as we intended, we shifted our emphasis to a comparative approach. The mapping technique (to be described below) was used in Indian as well as non-Indian settings. This method was found to be particularly effective when used by classroom teachers in monitoring interactions in their own classrooms over longer spans of time.

In this chapter also, the relationships between different measures is discussed both within and across different ethnic groups, including culturally patterned themes which emerge across different tasks.

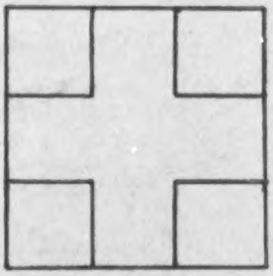
B. Block Construction Task

In three classrooms we used a visual-spatial task we have termed Block Construction. We used Design Cards for Colored Inch Cubes (from Developmental Learning Materials, DLM #111) and colored inch blocks. Essentially, the child was asked to copy the design on a card by using blocks in vertical construction. Our focus was more on the method the child used rather than on whether he or she succeeded in duplicating the design correctly, although this too was taken into account. The designers of the Design Cards describe their use as primarily valuable in developing a student's visual-perceptual abilities. The task is definitely visual, requiring the child to transform a visual representation into a three-dimensional reality.

The task was done individually. The child was first given a demonstration -- a design card was placed upright in front of him or her, and the task administrator built a duplicate of this design with blocks. The child was then told that he or she should do the same with the other cards. The researcher usually sat to the right and slightly behind the child, so that her recording of the activity would not be a distraction. A pre-printed recording sheet (see Appendix A) was used. As the child went through the eight design cards (we used numbers 1, 4, 7, 11, 15, 28, 24 and 29, in that order), the task administrator recorded the order in which the blocks were placed, whether the child took the blocks out of the box as he or she needed them or all at once, what he or she said during the task, whether the construction was vertical or horizontal, and as many other details of the child's approach to the task as she could. The children were timed on the total task.

In analyzing the results of this procedure (this must be considered a pilot analysis, since the N is small and the recording procedures were only slowly standardized), we found it convenient first of all to differentiate between an analytical method and a matching approach. Children whom we termed as using an analytical approach were likely to count the blocks needed, to do all the constructions in the same sequence (e.g., left to right), to take the ones needed out of the box and then construct, and not to look at the design card very often. Conversely, children whom we termed as using a matching approach were likely to take each block from the box as it was needed, to look at the design card and then at their own construction often, not to use any particular sequence, not to count, although they might name colors. Some of these children even tried to match their constructions directly to the cards by building as close to the card as they could. A third group of children, whom we termed mixed, used elements of both analytical and matching techniques.

For purposes of correctness, we counted as correct designs made correctly but horizontally. Design card #28 proved particularly susceptible to being constructed horizontally. It consists of a cross formed by five red blocks with the corners being filled in by four green blocks. On the card there are no demarcations of individual red blocks. (See sketch.)



This design proved visually overwhelming in such a way that the majority (21/34, or 62%) of the children apparently felt compelled to construct the cross first, and then fill in the green corners. Obviously this procedure can only be carried out horizontally. Once having constructed #28 horizontally, the last one, #29, was more likely to be done horizontally, since it, too, is a nine-block square structure, like the cross. (In no case did a child who had constructed #28 vertically construct #29 horizontally.) Table 1 shows the results from the three classrooms in terms of method, average score (number correct out of eight), and total time.

Table 1. Block Construction Methods and Scores from Children in Three Classrooms.

	N	Mean Age	Method			Mean Score	Mean Time (min.)
			Analytical	Mixed	Matching		
A.*	13	5,11	2	3	8	6.2	10.6
B.	11	7,10	6	3	2	6.8	11.0
C.	10	9,7	6	0	4	7.7	5.1

*A. Pueblo Kindergarten, B. San Diego, C. Albuquerque South Valley

The use of a matching _versus_ an analytical approach seems to be clearly age-related. That is, the majority of the kindergarten children used a matching method, while the majority of the others used an analytical method. It is notable, however, that a considerable number of even the oldest children used a matching technique. With the small number of subjects, it is difficult to draw any conclusions; it may be that past age 8 (the lowest age in the Albuquerque South Valley group) children have a more or less established approach, explaining the absence of 'mixed' technique.

It is obvious that the task presented no great difficulty even at the youngest level, since the score was 6.2 correct out of 8. At the oldest age level (above 8 years), the task no longer discriminates among individuals (performance reaches ceiling). We suspect that the Pueblo kindergarten group may be very high scorers, especially in view of the fact that their score was not much lower than San Diego's; also, their time was faster than San Diego's. Without comparison with another kindergarten, however, it isn't possible to tell. The longer time of the San Diego children could also be explained by the fact that they carried on continuous conversation during the task, and did not spontaneously attempt to do the task fast, except for a few individuals. The Pueblo children, on the other hand, said hardly anything while performing the task; some of them seemed to be concerned with doing it fast. The Albuquerque South Valley group for the most part seemed concerned with speed -- perhaps because the task was easy, so that doing it as fast as possible became the challenge.

C. Interviews

One of the objectives of this study has been to discover the conceptions held by Indian people about the learning process. It has been our assumption that the opportunity that children have in a small and integrated community to observe adults at work as well as in varied social situations would result in a particular style of learning. Indian aides who work in classrooms with children may be particularly sensitive to the issues of concern to us, such as observational learning, modeling, the implications of children's respect for older members in their family, and styles of active teaching engaged in by traditional Indians in their efforts at working with younger children. As it was impossible for us to gather information on all of these subjects by direct observation on our own part, we decided to work with Pueblo people, requesting that they describe their own experiences as children and their own recollections of significant learning experiences.

Nineteen interviews were conducted with Pueblo people by the staff members. The interviewees included fourteen women and five men. Four of the people were not directly involved in education at the time of the interviews -- two were former Head Start teachers, one was a former classroom aide, and one was working in a research laboratory in a professional capacity. Of the fifteen who were directly involved in education, three were classroom teachers, one was supervisor in a bilingual program, one was curriculum director at an Indian secondary school, one was a cook at Head Start, one was an aide in charge of the art room, one was a janitor, and seven were regular classroom aides. The ages ranged from mid twenties to early seventies.

All interviews were taped and later transcribed. The interview procedure was informal -- it was usually conducted in the home of the interviewee. The initial interviews were exploratory and open-ended, but we were able to derive from them increasingly standardized and more productive guidelines for topics to be discussed. The final interview format is entitled Interview on Learning Experiences (see Appendix B). This schedule is intended to be used informally, not as a series of structured questions. Thus, the interviewer needed only to make certain that all the topics were discussed rather than that each question was asked. The schedule is also intended to be used by Indian people interviewing each other in situations where stimulation for thinking about Indian education is wanted. For example, the senior investigator used it in a workshop with Crow bilingual program teachers and aides, where it proved extremely effective in bringing about extended discussion on learning and education among Crow Indians.

The interviews conducted in this project were thus quite informal, and ranged broadly in topic, especially in the beginning of the study. Nevertheless, they provided us with excellent information about learning in the home and community setting, as well as extensive and thoughtful comments on the education of Pueblo children. All the pertinent information from the interviews is discussed in Chapters I, II and IV.

In addition to these interviews about learning with Pueblo people, we collected written self-reports from fifty college students about their study methods and their efforts at productive thinking. (See previous discussion in Chapter I, pp. 19-20.) After an initial period of self-observation, they were asked to write reports based on the following questions:

> Report on your personal learning strategies.
> Focus on three major aspects:
>
> 1. What are the ways in which you
>   handle input (such as lectures

or written materials you are studying)?

2. What do you know of your methods of storing and reorganizing that which you are learning?
3. What are your approaches to recall and the development of new ideas (particularly when you study for exams, and when you plan research)?

The results of these self-reports were discussed in Chapter I.

D. Mapping as an Observational Procedure

Ethnographic studies of the classroom have substantially increased within the last decade as anthropologists have joined members of other disciplines in viewing schools as important institutions to study (Wax, Diamond and Gearing, 1971). An effective view of how learning and socialization are connected in diverse societies is still a task for a future anthropology of education, argues Stanley Diamond (1971). In the meantime, methodology for the examination of classroom interaction is being developed (for reviews of this work, see Brandt 1972), even though there is fragmentation of focus and a lack of substantive theoretical foundation upon which to build such work. Among the variables which have been examined are the emotional climate of classrooms and the variety of communicative strategies used by teachers in their interactions with students. (A good sampling of such studies is presented in Cazden, John and Hymes 1972.)

In this study we had planned to examine a broad range of classroom phenomena. Unfortunately, it was more difficult to gain access to Pueblo classrooms for long periods of time than we had first anticipated. Thus, we narrowed our objectives to an examination of children's use of the physical setting of their classrooms (utilization of space and materials) and to a study of some interactional patterns between teachers and students in Pueblo and non-Pueblo schools. As our work was mainly done in classrooms which were organized along the informal model, with focus upon children and their activities, it was possible to observe children's choices of places and materials during periods in the day when a minimum amount of large-group activity was taking place.

The procedure involves the mapping of areas in the classroom; each distinct area (such as dress-up area, reading corner, easels) is represented by a circle or by separating lines. Because there are six observations made during each observation period of 30 minutes, the recording sheet contains six representations of the classroom. (For sample, see Appendix C.) Each five minutes, the whereabouts of children and teachers is recorded. To obtain more specific information, it is useful to specify what the children are doing as well as their location, as some areas have multiple functions. This is especially true with children in Grade 1 and above, as areas tend to be less specific with respect to type of use than they are in kindergartens. (In this study, it was found that it is possible to specify both names and activities of fifty children in less than five minutes, although for this it was necessary to use six recording sheets, each mapping the entire classroom once, for the six observations.)

While comparisons between classrooms were of primary interest to us, the mapping technique was found of greatest value when used by classroom teachers themselves in evaluating the effectiveness of their planning and teaching methods. A quote from one teacher is informative in this regard:

> It appears that mapping is an effective tool in providing significant data on children as they interact with teachers, peers and their classroom environment: by looking at a graph the teacher can quickly see in which centers the child was spending time and what other experiences were needed; the centers with little activity as indicated on the graphs were looked at carefully to determine how they could be strengthened, in terms of rearrangement and adding materials.

Using this technique, it is more difficult to compare classrooms with each other than to monitor changes in a single classroom over time because each teacher arranges her/his classroom somewhat differently. Information concerning two Albuquerque classrooms, one Tanoan Pueblo classroom, and one California classroom was collected. The use of some of the centers was comparable across schools, some centers had multiple uses, and still others had a unique function. As can be seen in Table 2, three out of the four classrooms had Arts and Crafts centers, while in the Tanoan Pueblo the Central Tables served this purpose; a Reading Corner or a rug area surrounded by bookcases was available in three rooms; another center was labeled Cognitive -- this is where children had access to educational games, math materials, etc. A Media/Music center with a record player and sometimes a cassette tape recorder was present in three of the classrooms. In both kindergartens there were what both we and the teachers call the Central Tables, where new activities are presented to the children, and where some arts and crafts take place as well as some reading-type activities. Both kindergartens also had two other areas which were not present in the upper grades: an area with large blocks, toy animals and cars (Large Blocks), and an area termed Role-Play, which contained toy stoves and sinks, dolls, dress-up clothes. The two kindergartens and the South Valley classroom all had areas labeled Science, where there were items like aquariums, plants and animals. What we have labeled Conversation in both upper grade classrooms really consisted of several spaces where students generally just 'hung around' and talked rather than engaged in any specific activity. The centers unique to one classroom only were Cooking at the South Valley school, where the students had a stove they made use of in real cooking, and Native Language Center at the Tanoan Pueblo classroom, where the Bilingual Program teacher gave her lessons to anyone who wanted to take part, at certain times of the day. The column labeled Other in Table 2 is probably

Table 2. Summary of Observational Data Gathered in Two Kindergartens and Two Multi-age Classrooms: Percentages of Time Children Spent in Each Area

School	Day	I Arts/ Crafts	II Reading	III Cognitive	IV Media/ Music	V Central Tables	VI Large Blocks	VII Role-play	VIII Science	IX Conversation	X Unique	XI Other
North	1	6*		24T **		51T	4	13	0			
Valley	2	10		24T		41T	13	1	10			
Kinder-	3	7		40T		43T	3	6	0			
garten	4	4		34		29T	40	0	0			
	5	10		10T		36T	0	3	39T			
N = 15	6	18		17		47T	14	4	0			
	7	17		43T		24T	0	0	17			
	all	10		28		39	11	4	9			
Pueblo	1	(Incl.	13T	2	11T	13	33	28	0		(Nat. Lg.) 0	2
Kinder-	2	in	30T	0	7	20T	20	13	5		0	5
garten	3	column	0	4T	23T	31T	13	0	0		29T	0
	4	V)	7	9	2	31T	18	16	4		0	13
N = 12	5		0	0	10	58T	13	4	1		11T	3
	6		2	0	14	29	2	18	8		24T	4
	all		9	3	11	30	16	13	3		11	5
San	1	22	0	18	21T					35		
Diego	2	26T	3	26	12					37		
	3	23T	2	20T	12					43		
N = 23	4	16	7	23	20					32T		
	all	22	4	22	16					37		
South Valley N = 52	1 day	13	½	42	12				0	22	9 (cooking)	2

*This should be read as follows: 6% of child-time during the 30 minute observation period was spent in Arts and Crafts.

**Areas where percentage of child-time is followed by 'T' had a teacher or teachers present more than 50% of the time that children were present.

necessary in all observation, since there are always some students 'in transit,' or just standing around looking for something they want to do. It is probable that some students in both the North Valley kindergartens and San Diego were in this position, although at the time the observations in those classrooms were made, this was not taken into account.

A few comparisons in the children's use of space and materials in these classrooms can be made on the basis of Table 2. We can see, for instance, that in San Diego (Grades 1 - 3) there was much more consistent use of areas from day to day than was true in either kindergarten. It is also evident that only the older children 'hung around' and conversed with each other. The kindergarten children's social interactions and conversations with each other always took place in conjunction with other activities. This is consistent with what is known about language development in children -- namely that the younger the child, the more is his/her language tied into the immediate situation. For the kindergarten children, there were one or two areas in each classroom where the children tended to cluster: in the North Valley classroom, they congregated at the Central Tables and in the Cognitive areas, while the Pueblo children clustered at the Central Tables. In both multi-age classrooms, the children were spread around the room: in San Diego, for instance, 'Conversation' really refers to several spaces; in the South Valley school, both Cognitive activities and Conversation were carried out in many different spaces.

Differences between older and younger groups were also obvious in the interaction between teachers and students. The kindergarten children in both classes tended to cluster around teachers -- thus, the Central Tables nearly always had teachers present, as well as the most students. In the North Valley kindergarten, a teacher was often present also in the Cognitive areas, where a second cluster of children was found. In both kindergartens also, whenever a large percentage of time was spent by children in areas other than the two mentioned, a teacher was likely to be present (North Valley: Science on Day 5; Pueblo: Reading on Days 1 and 2, Media/Music on Days 1 and 3). In contrast, in the San Diego classroom , teacher presence/absence makes no difference to the amount of time children spend in the different areas. In the South Valley classroom, on the day of observation, one teacher first circulated and then took a group of students for a musical game outside. The other teacher played checkers with one student, while 4 - 5 others watched and waited their turn -- this did not amount to 50% of child-time in the Cognitive column, and so neither teacher appears in the table. The main contrast between younger and older children is that the younger ones follow the teachers, while the older ones choose their activity and the teachers join their groups.

The two kindergartens differed from each other also in some ways. In the North Valley kindergarten, children made quite extensive use of games and puzzles (Cognitive), while the Pueblo children did not. They did so even without the teachers, as is evident from Days 4 and 6 in the table. Moreover, data from the afternoon group (different children; not shown in Table 2) indicate the same situation, in that 26% of total child-time was in the Cognitive area, but without any teachers. The Large Block and Role-Play areas were interesting in that boys overwhelmingly used Large Blocks while girls used Role-Play. There isn't much difference in the use of Large Blocks between the classrooms, but it seems that Role-Play was used more extensively in the Pueblo kindergarten. It seems also from the table that Pueblo children did not engage in much art work during the observational periods, although some activities at the Central Tables were art activities. However, some art went on at the Central Tables in the North Valley classroom, where in addition children engaged in Arts and Crafts on their own. In the Pueblo kindergarten art activities were generally carried out during more structured times and so do not show up in our table. Although the two kindergarten classrooms differ in spaces and materials made available to the children and in instructional emphasis (and this accounts for some of the differences of course), we believe we have captured some true differences in children's preferences: Pueblo children did not use puzzles and games very much, while this was one of the favorite activities of the North Valley children, and Pueblo girls role-played more than North Valley girls. That these differences were not due to particular chance groupings of children but probably real ethnic group differences is supported by a comparison with the afternoon kindergarten group at the North Valley School: Cognitive child-time, as we have indicated, for the afternoon group was 26% (morning group 28%), and Role-Play child-time was 4% for both groups.

The mapping method allows for a number of different kinds of analyses of informal classrooms. First, it is possible to use the method at any time of a school day -- both structured time and 'free' time. One can vary the type of information recorded in addition to location of children and teachers: sex, names, and activities of children can be added.

In the analysis reported above, we were mainly concerned with class use of space and materials during 'free' time. For this, we needed only to record children's and teachers' locations at appropriate times of the day. In addition, in the North Valley kindergarten teachers made use of the information we gathered to change the spaces and centers in the classroom -- for example, our observations done in February (not reported here) showed that children were not using the Arts & Crafts area, so the center was changed and more materials were added.

Another type of information easily obtainable through this method is class time devoted to different classroom activities. For this purpose, mapping would be done at different times of the day, not only at 'free' time. This type of analysis would be the most appropriate when comparisons among different classrooms and schools are desired, or when classroom teachers are concerned about their own and their students' use of available time.

One can also analyze individual children's use of space and materials, individual children's involvement in activities, and amount of teacher-student interaction on the part of individual children. For this type of analysis, recording of names in addition to location is necessary, and in most cases, also of activities. One teacher in a pre-school used this observational procedure to chart individual children's and teachers' locations. From observational data obtained the first week, the teachers in the school were able to pinpoint reasons for children's apparent restlessness (they were having difficulty in keeping children involved in any center for any length of time), and by the fourth week of observations had been able to resolve the problem to a large extent (Myers 1975). The mapping of individual children's locations enabled them also to document the change.

In the Pueblo kindergarten, we recorded names of children as well as locations. From this data, it was easy to chart individual children's use of space and their preferences for working with teachers or without.

In Table 3, the percentage of time each child spent with a teacher present and the percentage of time she or he spent in each area is presented. Three children (Boy 1, Girl 1 and Girl 2) seemed to prefer working with teachers -- they spent 60% or more of their time with a teacher present. Five children (three girls and two boys) spent about equal amounts of time with and without teachers present. Two girls and three boys showed a preference for activities where a teacher was not present -- they were with teachers less than 40% of the time. For these five children, it was obvious that their main interest during 'free' time was Role-Play (for the girls) and Large Blocks (for the boys). In actual fact, these activities should probably all be termed Role-Play, since the girls used the play kitchen and dress up area, while the boys built structures with large blocks and drove toy cars around. For Boy 3, it seems that Large Blocks (role-play) was of equal interest with working at the Central Tables with a teacher. For Girl 5, Role-Play was a strong secondary interest. Boy 2, on the other hand, exhibited no very strong primary or secondary interest -- he moved around into many areas, and, moreover, had the highest percentage (12%) of 'Other' of all the children -- this additionally indicates that he spent some time just standing around. (Also, his participation in Role-Play (12%), usually reserved for girls, actually consisted of attempts to disrupt the play of the girls.) Girl 4 showed two primary interest

Table 3. Pueblo Kindergarten Children's Use of Space and Interaction with Teachers

	With teacher	Reading	Cognitive	Media/Music	Cent.Tbls.	Large Blocks	Role-Play	Science	Nat. Lang.	Other
Boy 1	75*	4	0	29	25	11	0	0	25	7
Girl 1	63	7	7	11	37	7	15	0	15	0
Girl 2	61	4	0	14	46	4	7	14	11	0
Girl 3	56	13	6	19	50	0	0	13	0	0
Girl 4	52	4	0	0	35	0	9	9	39	4
Boy 2	46	15	0	15	27	8	12	0	12	12
Girl 5	44	4	4	7	44	4	26	7	0	4
Boy 3	43	7	0	3	38	34	0	0	10	7
Girl 6	39	0	0	7	36	0	54	0	0	1
Girl 7	35	4	0	15	27	4	42	4	0	4
Boy 4	34	7	7	7	21	41	3	0	10	3
Boy 5	28	10	3	21	14	45	3	0	0	3
Boy 6	28	7	0	0	21	55	0	0	10	7

* This should be read: 75% of Boy 1's time was spent with a teacher.

areas -- Central Tables and Native Language. Boy 1 had three primary interest areas -- Media/Music, Central Tables and Native Language. In Section G of this chapter we will discuss how these observation results can be related to the results of some individual tasks that we carried out.

The mapping procedure can also be used to analyze peer interaction. In the South Valley classroom, about half of the children were Chicano and half were Anglo. Through the use of the mapping procedure, it was discovered that children in this classroom on the whole interact freely, that is, there is no segregation along ethnic lines. Table 4 shows the number of groups of Anglo only, Chicano only, and Mixed of each size of group which formed during the 'free' time observation period. (There were six separate observations, two during the ten minutes before afternoon recess and four during the twenty minutes immediately after the recess.)

Table 4. Numbers of Each Type and Size of Group Formed During 'Free' Time in a Multi-Ethnic Classroom

Group Size	Anglo Only	Chicano Only	Mixed	Total
1	6	9	n/a	15
2	6	6	10	22
3	4	3	14	21
4	1	0	12	13
5	0	0	5	5
6	0	0	2	2
7	0	0	1	1
8	0	0	1	1

The same type of analysis could be carried out if the interest is in age or sex, for instance, to discover to what extent groups of different ages versus same age groups are formed, and mixed groups of boys and girls versus same-sex groups.

In summary, we feel that the versatility of the mapping procedure makes it very promising as a tool for obtaining many types of information about use of space and interaction in informal classrooms.

E. Story Retelling and Drawing

1. Procedure

Our interest in retold stories of Indian children is linked to a variety of concerns. Some of these are theoretical, others are rooted in the practical tasks we were confronted with during a decade of educational ferment. The technique was originally developed during the early days of Head Start as a method of working with children whose languages and cultures differed from the mainstream.

The first studies using the story retelling method were conducted in the mid-sixties with young children drawn from differing ethnic communities (John and Berney, 1967, 1968). The method is an attempt to capture both linguistic and cognitive patterning in children's performance. All children are exposed to the thematic discourses of their elders. In tribal communities, traditional tales, such as the winter-tales among the

Navajo, are an integral part of community life and the socialization of children. In urban communities, the exposure to sequential language is manifold, it includes the mass media as well as face-to-face experiences. We know little of the ways in which children select, transform and store these streams of words. It seems reasonable to assume that a general cognitive process that consists of a simplification of sequential language is shared by all children, but that children differ in the extent to which they rely upon key words and/or images in storing a theme, or story sequence. During recall or retelling, a simplified internal version is reexpressed in communicative language. The style in which the child retells the story, and the themes which now appear salient in the child's retold version may reveal the particulars of cultural emphasis. The findings of the studies conducted in the sixties showed that in their retold stories children differed greatly. Ethnic membership emerged as a crucial variable correlating highly with lengths, style and thematic content. The data showed similarities to the work of Stodolsky and Lesser (1967), who have found ethnic differences among children in terms of their salient approaches to cognitive tasks.

In the present study, we added to the story retelling task the production of a visual representation of the story as well -- we asked the children to draw something from the story. In this way, we were able to obtain two different types of representations of the same story -- verbal and visual -- from the same child.

We used three different modified versions of the original story retelling book (John and Berney, 1967). The modification which was consistent in all three versions was the shortening of the test. (See Appendix D for text.) One of our versions was the original Navajo one, another the original Black version. Our third version was a modification of the Navajo version for Pueblo children -- the corn husk doll in the pictures was changed to a rag doll, and the *hogan* into a Pueblo style house. The story texts were modified to concur with the drawings in the different versions. In the 1967 study by John and Berney, it was found that the version used did not affect the results attained. The following chart shows which version was used at each site:

Keresan Pueblo	Pueblo Version
Tanoan Pueblo	Pueblo Version
Northeast Heights	Black Version
North Valley Kindergarten	Navajo Version
New Mexico Summer School	Navajo Version and Black Version
New Mexico Commune	Black Version
San Diego	Navajo Version

In most of the story retelling, the following procedure was followed. The field worker read the story to the child, making certain that he/she had a good view of the story pictures. Next the tape recorder was turned on, and the child was asked to tell the story to the field worker while being shown each of the pictures in sequence. No prompting, aside from encouragement, was done after the first picture. When the child completed retelling the story, he/she was given a 12 x 18 sheet of white construction paper and a set of crayons, and asked to draw a picture of something he/she particularly liked in the story.

It became evident after a few stories in the Keresan kindergarten that the children were greatly handicapped in English -- that is, the story in English could tell us very little about how these children processed verbal and visual information. Arrangements were attempted to administer the task in Keres; for various reasons it was possible to obtain stories from only three kindergarten children in their native language. The administration of the task was carried out by the aide in the classroom; she proceeded as described above, except that she did not tape the stories; instead she transcribed them by hand, translating directly into English. The children reportedly asked not to be recorded. The aide prepared for the story telling by translating the story into Keres orally and taping several versions of it until she felt it was adequate. However, she told the story herself when doing the task, rather than using the tape.

After we had done the story retelling with most of the first grade children in the Keresan Pueblo, we felt that a Keres version was in order also for first graders. We recruited an aide who worked with many groups in the school (she was not assigned to any particular classroom). She had time to do the story with four children. She played the tape prepared by the first aide to all four at the same time, while turning the pages of the book. She then had the children retell the story individually, out of earshot of the others, while she transcribed directly into English.

In the Tanoan Pueblo, the kindergarten teacher herself collected the stories from the children. In this school, as we have indicated, the majority of the children are native English speakers, but there is a bilingual program. Consequently, about four months after the original story retelling was done, a former teacher in the bilingual program administered the Story Retelling task to the same children in the native language. The procedure she followed was exactly the same as for all English versions. (Only one of the children, however, retold the story in the native language; the others retold it in English, despite the fact that all instructions and encouragements were given in the native language.)

We transcribed the taped stories as soon as possible after the activity and as completely as possible, including all pauses, redundancies and prompts by the field worker.

2. Results: Textual Analysis

Our first analysis was done in terms of the following categories (see sample analysis sheet, Appendix E).

Phrase	A unit usually marked by a pause, and usually containing a subject and verb. The main criterion, however, was that it be a thought unit or meaning unit that could stand by itself and still convey information to the listener.

Types of phrases:

SD	Stimulus-derived. The phrase refers to something present in both picture and text; wording need not be close to the actual text.
SRI	Story-relevant inferred. The phrase refers to something present in the text only; it cannot be in any way derived by looking only at the picture, never having heard the text. Some of these phrases can be very different from the actual text, but have the same meaning. Others are almost an echo of the text, or even a verbatim repetition.
Elaboration	This category contains two different types of phrases. One is a phrase that refers to something which is in the picture but not in the text (visual elaboration). The other type is a phrase which represents something the child has added to the text of the story which makes sense in the context -- something that arises out of the child's involvement in the story and his/her creativity (textual elaboration). (Although on the analysis sheet we differentiated these two types, in most cases there were not enough total instances to warrant this separate analysis.)
Elsewhere in Story	The phrase refers to something in the story, but is not related to the particular picture being viewed nor the text that goes with it.

Other	Comment unrelated to story or picture content.
Fragment	An incomplete phrase, usually arising when a child changes his/her mind after starting a phrase and instead stops and begins another. (Fragments were not counted into Total Phrases in our analysis.)

In the analysis, the retold phrases for the first picture are not counted, since it is here that the task administrator ensures understanding of the task with prompts and questions. Similarly, if prompts or questions occurred in later pictures, the children's production after such prompts were not counted. For the text of the Pueblo version of the story, we counted 14 SD phrases and 80 SRI phrases for a total of 94 possible phrases.

In Table 5, the results of Story Retelling in the Pueblo schools are presented. (No statistical tests were done on these or any other results because of the low Ns, and our discussions are intended to indicate trends only.) If we look at the Keresan Pueblo classrooms first, it is obvious that in terms of language used, the children's stories in Keres were much fuller than those in English. (For example of a child's story in both languages, see Appendix F .) The English versions were what might be called 'basic' stories; the bare essentials of the pictures and text, with very little elaboration. The similarity in quantitative results between the kindergarten and first grade Keresan Pueblo classrooms when the story was told in English could be

Table 5. Story Retelling Scores for Pueblo Children in English and in Their Native Languages

	Keresan Pueblo Kinderg. (English)	Keresan Pueblo Kinderg. (Nat.Lang.)	Tanoan Pueblo Kinderg. (English)	Tanoan Pueblo Kinderg. (Nat.Lang.)	Keresan Pueblo 1st Grade (English)	Keresan Pueblo 1st Grade (Nat. Lang.)
N	7	3	13	12	21	4
SD	3.6	5.7	5.0	5.0	4.6	2.8
SRI	6.6	10.7	7.3	3.3	5.3	15.5
Elaboration	1.3	1.4	1.6	2.1	1.8	5.3
Elsewhere in story	0.8	0.7	0.8	0.6	0.2	1.0
Other	0.9	0	0.5	0.2	0.3	2.3
Total	13.0	18.4	15.2	11.2	12.2	26.8

due to disparate samples. We would expect an increase at first grade in number of phrases, just as there is an increase when the story is told in Keres or for non-Indian children (see below). However, the first grade class sample comprised the entire class while the kindergarten sample comprised seven children, three of whom were native English speakers. Since it was decided not to do any more story retelling in English in the kindergarten on the very basis of difficulty in the language, it is likely that the inclusion of the eight other children would have lowered the average number of phrases considerably. For the Tanoan Pueblo children, the results were the exact opposite. In the Tanoan Pueblo kindergarten, as we have mentioned before, the children's first language is English, except in the case of one child. Thus, the stories they retold were fuller in English than in the native language version. It should also be remembered that the children, with one exception, retold the story in English, even when it was told to them in the native language of the Pueblo. The likelihood that they did not even comprehend much of the story on this occasion is shown by their reliance on the pictures rather than the text -- the production of SD rather than SRI phrases. This was the only group of children in our sample whose SD average was higher than the SRI average. Moreover, their elaboration average is somewhat higher than is the case in the other kindergarten groups -- an average of 1.2 phrases of the 2.1 elaboration phrases is what we have termed visual elaboration: a reference to something which is in the picture but not in the text. It seems, then, that the children relied minimally on the native language text in retelling the story -- in fact, they most probably did not understand much of it, since they failed to reproduce the text even in translation.

From even these preliminary results, it is our conviction that the Story Retelling procedure is a very promising language evaluation method in bilingual programs and situations, especially when some measure of sequential speech rather than a measure of vocabulary is desired. For example, no matter what the children's age, in their stronger language, the average number of SRI phrases and total phrases is higher. If these children have any productive competence in the language being evaluated, they will produce more SRI phrases than SD phrases, and these phrases (SRI) are mostly complete sentences; the higher the proportion of SD phrases, the less competence in producing complete sentences the children have (Keresan Pueblo children). If the children have no productive competence in the tested language, they will most likely tell the story in their first language. If they, moreover, are weak in comprehension as well, SD phrases will predominate over SRI phrases (Tanoan Pueblo children). Two children in the Tanoan kindergarten who were judged to have good comprehension of the Pueblo language (aside from the one native speaker) told the story in English but with a greater number of SRI phrases than SD phrases (10 SRI, 2 SD and 7 SRI, 5 SD respectively). Because there is much concern over bilingual programs today especially concern about ability to use the two languages effectively, it is our hope that we or someone else will be able to elaborate this method of language evaluation, since it is one of the few which attempts to handle both comprehension and production of sequential text, and in doing this, utilizes an activity that is both pleasurable and meaningful for young children.

In Table 6 are presented the Story Retelling scores from the Anglo classrooms where the procedure was used. It is evident that the profiles of the classes differ. The Commune kindergarten children told a fairly 'basic' story, with little deviation from the text and an average number of two phrases per picture (9 pictures, average of 17.5 total phrases). On the other hand, the older Commune children told fairly long stories (average 3.5 phrases per picture), and their SD average as well as their SRI average was higher than that of the kindergarten group. The New Mexico Summer School group differed in several ways from the others. Their ratio of SRI to SD phrases was the highest (4:1) of all the groups; they also displayed more elaboration and 'other' phrases than the other groups. These results indicate that their stories were based on the text rather than

Table 6. Story Retelling Scores for Anglo Children

	New Mexico Commune Kindergarten	New Mexico Summer School	Northeast Heights First Grade	New Mexico Commune First Grade
N	6	19	22	6
SD	5.5	3.4	5.4	8.0
SRI	9.8	14.6	16.9	18.7
Elaboration	0.7	2.9	2.[illegible]	1.3
Elsewhere in Story	0	0.6	1.4	0.7
Other	1.5	4.7	1.6	2.5
Total	17.5	25.9	27.7	31.2

on both pictures and text and that they in general were at home in the verbal mode, although not necessarily always staying with the original task of faithful retelling of the story.

Table 7 shows results for the two Chicano groups in our sample. It is evident that the younger group (North Valley Kindergarten) told a more basic, shorter story than the older group (San Diego). The San Diego group show a fairly high amount of elaboration. In these data, there is no indication in either case that English may be a second language for the children, and in fact for all the North Valley children English is the dominant or the only language; in San Diego, Spanish is the dominant language for some of the children, while the rest are dominant in English, although all are bilingual.

Table 7. Story Retelling Scores for Chicano Children

	North Valley Kindergarten (Mean Age: 6,0)	San Diego Classroom (Mean Age: 8,11)
N	8	11
SD	5.7	5.8
SRI	8.7	17.5
Elaboration	1.5	3.7
Elsewhere in Story	0	0.8
Other	2.8	0.3
Total	18.5	28.2

Summarizing Tables 5, 6 and 7, it is evident that there are both language and age differences in the retelling of the story, and that different groups exhibit different profiles. Within the same age group, and if the child hears and tells the story in his/her native language, the quantitative aspects of the results are virtually identical. Thus, all kindergarten groups with the exception of the New Mexico Summer School display similar profiles in total phrases, and in the proportions of SRI to SD. The New Mexico Summer School children score more like first grade children than like the other kindergarten groups. This result is, we feel, due to two factors: one is that the children averaged a little older, since this was in the summer after the school year. The other is that the children's background is not one of average American middle class, but rather one of a select, highly educated group. Children of such a group would be expected to be extremely verbally oriented and well socialized into a world of books, stories and school-oriented tasks. Although the total number of phrases for the first grade and above groups was very similar, there were differences in, for example, elaborations. The Keresan Pueblo first graders (native language story) showed the highest number of elaborations, with the San Diego classroom exhibiting the next highest. Also, the same Pueblo first graders showed a higher proportion of SRI to SD phrases (5:1) than any other older group.

Younger children tended to tell a 'basic' story, with somewhat more SRI than SD phrases, and not many diversions or elaborations; the same was true of older children when telling the story in their second language. We may conclude that children whose ability in verbal expression, especially with respect to sequential material, is still very much developing will rely on visual material even in verbal representation. In the next section, we will discuss the children's visual representations of the stories, and how these are related to their verbal production.

3. Results: Analysis of Drawings

Superficial inspection seemed to indicate that the Pueblo children's drawings were both more sophisticated and more creative than the non-Pueblo children's. For analysis, we used two scales developed by Mooney and Smilansky (1973) for scoring children's drawings. One scale is for artistic performance. Money and Smilansky state: "Artistic scores... indicate quality of drawing taken as a medium in itself and as a means of revealing the experience the child was undergoing as he was relating to objects in his world through the drawing act" (p. 40). The other scale is for cognitive performance. Mooney and Smilansky say: "We define the cognitive aspects of a drawing as those which refer to what the child appeared to know of the object which had been made the 'subject' for drawing" (p. 37). Both are eight-point scales, with possible scores of 0 - 7. These scales were developed for sets of drawings different from ours. The original drawings were mostly of one specific object or figure only, while for our drawings, the children were simply asked to 'draw something from the story that you particularly liked,' resulting overwhelmingly in drawings with multiple objects and figures. Consequently, we modified our interpretation of the directions accordingly. One of the major modifications was that we allowed a rater to use two scores (e.g., 3 - 4), and counted this as a score and a half (i.e., 3.5). The original scales, together with our modifications, are given below.

Cognitive Scale (After Mooney and Smilansky 1973, p. 40)

'0' for no drawing undertaken.

'1' for no recognizable subject or features.

'2' for a basic shape provided for the primary figure only. (Modification: We allowed for several figures.)

'3' for one or two features within the primary figure, recognizable only if subject of drawing is known. (Modification: We allowed for such features within the most prominent figure only, or within all figures.)

'4' for integration of three or four features into a clearly recognizable figure, plus some indication of effort to provide a setting for the figure to show better awareness of the location in which it actually occurs... or an indication of the grounding of a figure. (Modification: Most of the time, we found it necessary to separate the two parts of this directive; often we felt there was too great a distance between '3' and '4'. Hence, if there were one or several clearly recognizable figures containing three or four features each, yet no effort to provide a setting, the raters usually scored '3-4', or '3.5'.)

'5' for a clearly recognizable primary figure, not merely outlined but filled in with internal (five recognizable) features; also a recognizable figure in the background; quite good proportion in size between the recognizable figures; better setting provided for most of the figures; better grounding in placement for most figures.

'6' for most major features within the primary figure and one or two features in the background; the primary figure and the background forms making a recognizable interrelated whole; proportion in size between the forms as well as features good; setting provided for all figures; good grounding in placement of all figures; attempt to draw in perspective (to show a better awareness of the visual properties of objects in receding space when seen from a given point of view). (Modification: Again, often we felt that the distance between '5' and '6' was too great; if one or two of the descriptors for a score of '6' was absent, our raters tended to rate '5-6', or '5.5'.)

'7' for most major features within the primary figure as well as within the background; full integration of figures and features into a clearly recognizable whole; very good proportion in size between all the forms and features; setting provided for all figures; full grounding in placement for all figures; perspective shown quite good; "shadowing" (to show a better awareness of the visual properties of objects as affected by light).

Artistic Scale (After Mooney and Smilansky 1973, p. 41)

'0' for no drawing undertaken.

'1' for no pictorial content; a scribble with no control; paper almost empty.

'2' for a little pictorial content; a scribble with some control; several shapes, perhaps, but unrelated; three quarters or so of the paper empty.

'3' for one figure drawn, all alone; mainly in outline; quite stereotyped; half or so of the paper empty. (Modification: We allowed more than one figure. Also, we found it impossible to state that one figure was 'stereotyped' while another was not; consequently, we ignored this part of the directions. If there were one or more figures, yet three quarters of the paper or more was empty, the rater was likely to score '2-3', or '2.5'.)

'4' for one or more "objects" or shapes; showing some of either texture, shading, or line variation; forms somewhat stereotyped; no evident intent to include background or foreground even though the subject might call for it; some of the paper still empty. (Modification: Again, we ignored the directive about 'stereotyped'. The rater scored '3-4' or '3.5' if a) there was no texture, shading, or line variation but at least three quarters of the paper was filled, and there were several figures or b) there were several figures, some of either texture, shading, or line variation, but half of the paper still empty.)

'5' for two or more "objects" or shapes; showing some of each of texture, shading, line variation and decoration; forms somewhat original; usually some indication of background and/or foreground where the subject calls for it; most all of the paper used; spatial balance adequate. (Modification: We ignored the directive about 'original' forms. The rater was likely to score '4-5' or '4.5' if at least one of the descriptors for '5' did not apply.)

'6' for several "objects" or shapes; showing a great deal of texture, shading, line variation and decoration; some perspective may be evident; forms appear quite original and fresh; usually a lot of background and foreground included where the subject calls for it; all of the paper used; good spatial balance.

'7' for several "objects" or shapes; showing a great deal of texture, shading, line variation and decoration; perspective used where "natural" for the subject; forms are very original and fresh; background and foreground are well filled out where the subject calls for it; all of the paper used; exceptional spatial balance.

All drawings were rated by two raters (not always the same ones, however) and the average of the two scores taken. Table 8 shows the mean scores for all groups of children in the sample. (These groups were not necessarily the same as those reported for textual analysis -- in some cases, we divided the group into two different age groups.)

In this analysis of drawings, just as in the analysis of story text, the groups present different profiles. Some groups, such as Groups 2, 5, 7 and 10 show a difference of at least 0.50 points between the cognitive and artistic scores, with the artistic being the higher score. Notably, three of these groups are Pueblo groups. In terms of age, scanning the table we can see that there is no obvious increase in _either_ cognitive or artistic score as age increases. The highest cognitive score was obtained by the oldest group (Group 12), however, and the lowest was obtained by the youngest group (Group 1). But Group 3 had a cognitive score of 3.92 while Group 8 had a score of 3.08.

The large differences in both cognitive and artistic scores between Groups 2 and 3, since these are scores for the same children obtained on different occasions, are of interest. To a degree, the increase in scores

Table 8. Cognitive and Artistic Drawing Scores for Pueblo and non-Pueblo Children, by Age; Presence of Community and Classroom Support for Visual Expression

GROUP	N	COGNITIVE SCORE	ARTISTIC SCORE	COMM. SUPP.	CLASS SUPP.	AVERAGE TOTAL SCORE
1. New Mexico Commune Kinder. (4-5 yrs.)	6	2.75	3.08	-	-	5.83
2. Tanoan Pueblo K., (Eng. version, 5-6 yrs.)	12	3.04	3.75	+	±	6.79
3. Tanoan Pueblo K., (Nat. version, 5-6 yrs.)	12	3.92	4.10	+	+	8.02
4. North Valley K., (5-6 yrs.)	7	3.50	3.71	-	+	7.21
5. Keresan Pueblo (5-6 yrs.)	16	3.34	4.19	+	-	7.53
6. New Mexico Summer School (5-6 yrs.)	19	3.74	3.79	-	+	7.53
7. Northeast Heights (6 years)	11	3.36	3.95	-	+	7.32
8. New Mexico Commune 1st Grade (6-7 yrs.)	6	3.08	3.25	-	-	6.33
9. Northeast Heights (7-8 yrs.)	11	3.91	4.00	-	+	7.91
10. Keresan Pueblo (7-8 yrs.)	10	3.75	4.60	+	-	8.35
11. San Diego (7-8 yrs.)	10	3.45	3.70	-	±	7.15
12. San Diego (9+ yrs.)	11	4.30	4.30	-	±	8.60

from the English version to the native language version represents true growth in visual expression ability. There was a period of three and a half months between the English and the native language versions, and nearly all the children show an increase in both scores. Moreover, the period in question (end of November to March) is one during which the class engaged in a great deal of art activity, in preparation both for Christmas and the annual school arts and crafts fair. In the case of one boy, whose cognitive score rose from 1.00 to 3.00 and artistic score from 1.75 to 4.00, other information also indicates that this was true growth in visual expression ability -- this boy had not been to Head Start, nor had he apparently any previous experience in drawing, since he could not handle a crayon or pencil when starting school in September. After months of encouragement and individual attention he improved considerably in carrying out classroom activities in general. The case of a girl whose cognitive score increased from 3.25 to 6.25 and artistic score from 4.00 to 5.75 is more mysterious, and can only partly be explained by true growth in ability. This case, and most probably other cases as well, illustrate the caution necessary in interpreting children's drawings. Rhoda Kellogg (1969), among others, has warned against basing judgments of children's abilities on one single sample, as is done in the Goodenough Draw-a-Person test. On a class basis, another factor could have been that the task was somewhat different in the children's view -- that is, it could be that the native language version for some reason encouraged them toward superior visual expression. A possible third factor was that for the English version of the story, the children were given very large size paper -- 24"x 18" -- rather than 18"x 12". This may have led to depressed scores, especially since the children were not used to this size of paper. In summary, we believe this discrepancy in scores can be explained partly by true growth in ability and partly by conditions of task administration, but there is a residue of unexplainable variability.

The only statistical test we carried out on this data involved seventeen pairs of children matched within one month of age, with one of the pair being Pueblo, the other non-Pueblo. (Only the Keresan Pueblo, the North Valley Kindergarten, and the Northeast Heights classroom were involved in this comparison, and all scoring was done without the raters' knowledge of either the age or the origin of the child.) On the artistic scale, $t = -2.87$ was obtained -- this is significant at the .02 level. Thus, the Pueblo children did indeed score higher on "artistic performance." On the cognitive scale, $t = -0.77$, which is not significant, and thus we cannot say there were any differences in cognitive performance between the two groups.

Looking at differences among all the groups, we tentatively suggest that ability in visual expression may depend on two major factors, aside from the obvious factor of age: classroom for this mode of expression, and support from the social environment outside of school. By the latter we mean the presence of adults engaged in arts and crafts on a serious basis, and the accessibility to children of an obvious art tradition, as is true in the two Pueblos. In contrast to most non-Indian children, for example, Pueblo children are all exposed to Pueblo design elements in various ways: through pottery, jewelry, dance costumes and religious ceremonialism. The two groups which scored lowest on the drawings were the kindergarten and first grade children from the Commune, where neither factor is present. The group that scored highest when age is taken into consideration is the Tanoan Pueblo kindergarten (Group 3), after classroom support had been well established, and where community support also exists. Classroom support alone (Groups 4, 6, 7, 9, 11 and 12 in Table 8) seems to result for the most part in a medium score and a fairly even balance between cognitive and artistic scores, aside from some age differences. On the other hand, support from the social environment alone (Tanoan kindergarten, before classroom support was well established, and both Keresan Pueblo groups) appears to result in a higher artistic than cognitive score, yet where the cognitive scores are not necessarily lower than the ones from the previous type of group. It thus appears that our original hypothesis (John and Osterreich 1973) about exposure to arts and crafts being instrumental in encouraging a visual mode of learning has some preliminary support;

but more research in this area is certainly needed.

4. Results: Verbal and Visual Expression

In order to present a picture of results from verbal and visual analyses of story retelling as group profiles, we have devised Figure 1. These histograms show textual and drawing scores expresses as percentages, so that a representation is obtained which we feel is close to the existing balance of these two modes of expression in the different groups. The 'Total Phrases' scores are expressed as percentages based on the arbitrary ceiling of 40, and the 'SRI' scores are expressed as percentages based on the arbitrary ceiling of 20. In this way it is possible to tell, for instance, that in the Pueblo Kindergarten group, the 'SRI' score was less than half of 'Total Phrases,' while in the Northeast Heights First Grade, the 'SRI' score was more than half of 'Total Phrases.' (If 'SRI' were exactly half of 'Total Phrases,' the columns would be even.) Both cognitive and artistic scores are expressed as percentages of the true ceiling of 7. The Pueblo group results do not include the results from the native language version in either Pueblo. Looking at Figure 1, it is obvious that verbal expression takes second place to visual expression for the Pueblo groups, and that the opposite is true for the non-Indian groups. In addition, verbal expression scores increase with age for the non-Indian groups, while for the Pueblo groups it is the visual expression scores which increase with age. (It must be

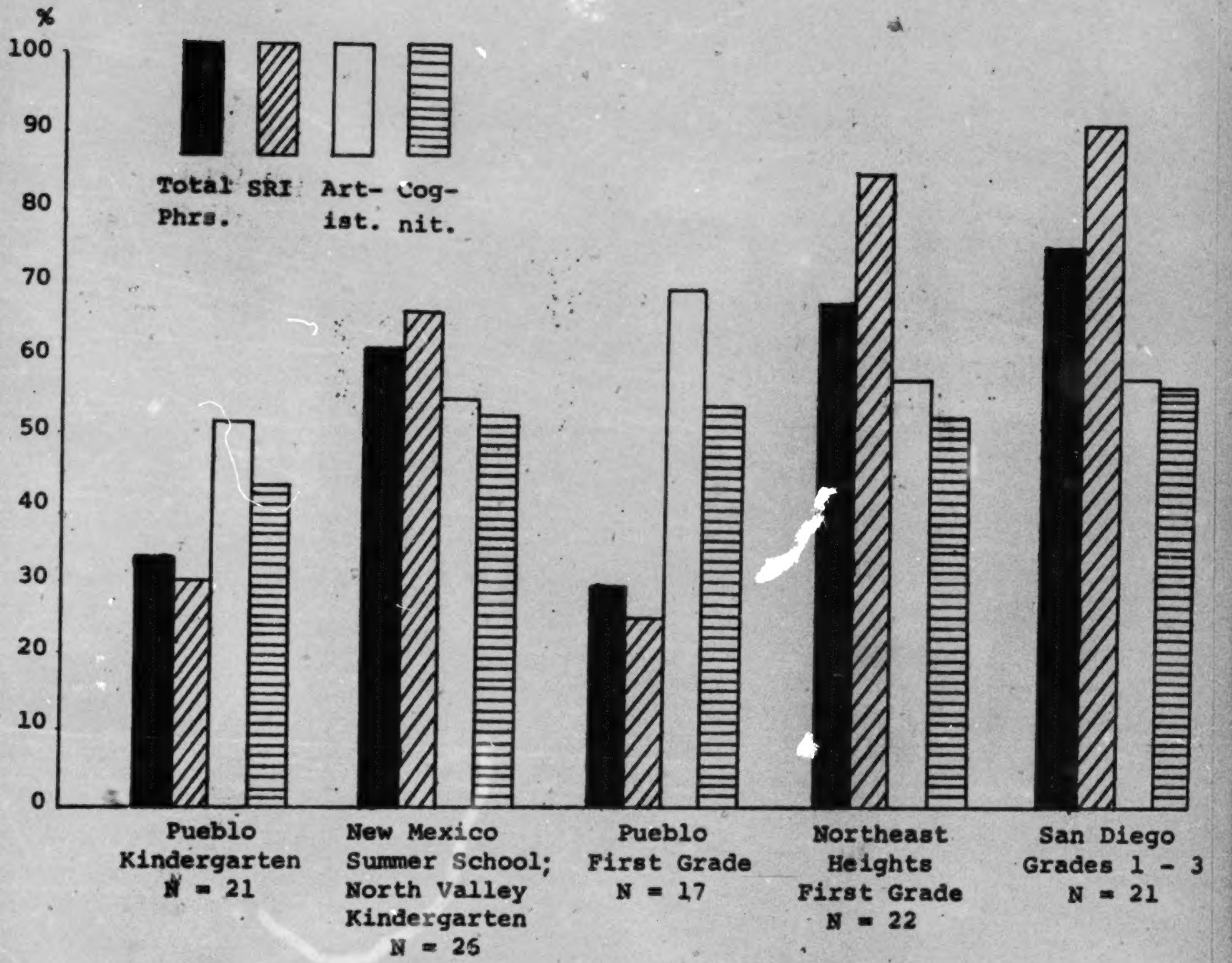


Figure 1. Textual and Drawing Scores from the Story Retelling Task for Five Groups of Children

remembered that the Pueblo Kindergarten group represents one classroom where most children's native language is in fact English, and another where this was also true in three out of nine cases, while the Pueblo First Grade group represents a classroom where most children's native language was Keres. This explains the lower scores of the First Grade group.) On the whole, visual expression scores do not differ among groups as much as verbal expression scores do. We can also see here in visual form what we discussed in the previous section: namely that the artistic scores of Pueblo children are higher than their cognitive scores, while for non-Indian children there is very little difference. The Northeast Heights and San Diego classrooms show remarkably similar profiles, despite the difference in the backgrounds of the children. The 'school learning' advantage of the Northeast Heights middle class children is evident in their only somewhat lower verbal scores and the very small difference in visual scores despite age differences, but the proportions among the four scores are the same. The non-Indian kindergarten children exhibit a profile in which the verbal and visual scores are closer than in any other group -- this probably correctly reflects the contemporary emphasis on encouraging children's self-expression in all modes at the kindergarten level (while post-kindergarten children generally receive a much heavier dose of verbally oriented instruction). The profiles of the Pueblo groups, on the other hand, reflect their superiority in visual expression over verbal expression in English, at least in this type of task which involves sequential story telling.

That this is true even for the Pueblo children whose native language is English may indicate that language use in the Pueblo is different from that in the school, and that even the Tanoan Pueblo children need to be 'socialized' into 'school verbal learning' modes, as long as this type of learning remains the emphasis of schools. We suspect that had the Story Retelling Task been readministered in English late in the school year, the profile for the Tanoan Pueblo would have been different -- it is obvious that ability in verbal expression of the type required in school increased considerably for this group, since they outscored first graders in a vocabulary test as we have mentioned.

A correlation matrix was calculated for the four scores -- Total Phrases, SRI, Artistic and Cognitive.

Table 9. Correlation Coefficients for Four Variables, N = 107

	Total Phrases	SRI	Artistic Scale	Cognitive Scale
Total Phrases	1.000	0.997	-0.371	0.447
SRI		1.000	-0.345	0.478
Artistic Scale			1.000	0.584
Cognitive Scale				1.000

All correlations in Table 9 are significant to at least the .01 level. We note that as might be expected, Total Phrases and SRI scores show the highest positive correlation.

The cognitive scores also correlate positively with Total Phrases, SRI, and the artistic scores. Mooney and Smilansky (1973) similarly obtained an overall correlation of .57 between cognitive and artistic scores. However, surprisingly, the artistic scores are negatively correlated with both Total Phrases and SRI. It seems clear, then, that the artistic scale taps some of the same abilities as the cognitive scale, but also some different ones. These results indicate that children who tell longer stories also are able to express well, in drawing, what they know of the object or objects that they have chosen to depict (cognitive performance, after Mooney and Smilansky 1973). On the other hand, these same children are not able to project their imaginative ideas and experience of the world through the use of drawing as an artistic medium (artistic performance, after Mooney and Smilansky 1973). A corollary is then that children who perform less ably in the verbal mode do use the visual mode for expression of their experience.

In order to find out if there was a correlation between verbal and drawing scores, we calculated the Pearson product-moment correlation coefficient. Table 10 shows the results for all the groups we worked with.

For the combined groups, the first three in Table 10, there is no correlation between verbal and drawing scores. When the different groups in the study are separated, however, the picture is different. We note that for the younger children, there is no correlation, but some groups exhibit a tendency toward a negative correlation. For the older groups, there is in one case a significant correlation (Keresan Pueblo, 7-8 years), and in two of the other three

Table 10. Correlation Between Total Phrases and Combined Cognitive and Artistic Drawing Scores for All Groups

GROUP	N	PEARSON r	DRAWING SCORE
Pueblo	38	+.07	N/A
Non-Indian, New Mexico	48	+.08	N/A
Non-Indian, San Diego	21	+.07	N/A
Keresan Pueblo, 5-6 yrs.	16	+.05	7.53
Tanoan Pueblo, English version	12	+.09	6.79
Tanoan Pueblo, Nat. Lg. version	12	+.12	8.02
New Mexico Commune	12	-.26	5.83
North Valley Kindergarten	7	-.41	7.21
Northeast Heights, 6 yrs.	11	-.40	7.32
New Mexico Summer School	19	+.43*	7.53
Northeast Heights, 7-8 yrs.	11	+.18	7.91
Keresan Pueblo, 7-8 yrs.	10	+.62*	8.35
San Diego, 7-8 yrs.	10	-.17	7.15
San Diego, 9+ yrs.	11	+.36	8.60

*$p < .025$

cases at least a tendency toward a positive correlation. The New Mexico Summer School is an exception since this is a younger group with a significant correlation between the two scores. It should be remembered that in their verbal score they also resembled the first-graders more than they did other kindergarten children (Section E 2 in this chapter). The San Diego 7-8 year-old group is also an exception, since the direction for this older group is toward a negative rather than a positive correlation. We note with interest that in four out of the five groups with the lowest drawing scores the correlation between verbal and visual scores is in a negative direction. These results will be discussed further in Section A, Chapter IV.

Another way of looking at the relationship between verbal and visual scores from the Story Retelling task is to see whether the groups differ in the proportions of children who exhibit various combinations of high and low scores. Table 11 shows the percentage of children in each of the groups who obtained the four possible combinations of high and low total phrases and drawing scores. Included in the table are also the percentage of children who did not fall into any of the four categories -- that is, children who obtained medium total phrases scores and/or medium drawing scores. It is evident that the groups differed considerably in the way children were distributed. There were four groups (#2, 6, 9 and 11) in which most children (70% and over) did not fall into any of the categories we are concerned

Table 11. Percentage of Children in Different Groups Obtaining Four Possible Combinations of High and Low Total Phrases and Drawing Scores.

Group		N	I High P* High D	II High P Low D	III Low P High D	IV Low P Low D	Med P and/ or Med D
1.	Keresan Pueblo 5-6 yrs.	16	6**	0	31	25	38
2.	Tanoan Pueblo English Version	12	0	0	8	17	75
3.	Tanoan Pueblo Nat. Lg. Version	12	0	0	42	17	41
4.	Keresan Pueblo 7-8 yrs.	10	20	0	20	20	40
5.	Commune	12	8	25	0	8	59
6.	North Valley Kindergarten	7	0	29	0	0	71
7.	New Mexico Summer School	19	21	11	11	16	41
8.	Northeast Heights 6 yrs.	11	18	18	0	0	64
9.	Northeast Heights 7-8 yrs.	11	9	0	9	0	82
10.	San Diego 7-8 yrs.	10	0	20	10	10	60
11.	San Diego 9 yrs.	11	27	0	0	0	73

*High Total Phrases = 20.0 +
Low Total Phrases = 15.0 and under

High Drawing = 9.00 +
Low Drawing = 6.00 and under

**This should be read: 6% of the children in the Keresan Pueblo 5-6 year old group obtained a high score in both total phrases and drawings.

with. That is, the majority of the children in these groups scored at medium levels in Total Phrases and/or Drawing scores. In contrast, in four other groups (#1, 3, 4 and 7) less children (41% or less) scored at medium levels than in the extreme categories.

The distribution of children into the four categories of interest also differed among groups. For instance, no Pueblo child fell into Category II (High Phrases, Low Drawing). The younger Pueblo children mostly fell into Categories III and IV, while the older Pueblo group (#4) had children evenly distributed in Categories I, III and IV. As we know that the Pueblo groups generally scored low in Total Phrases and high in Drawing, the number of Pueblo children in Category III is not surprising. However, that there were also relatively many in Category IV indicates that by no means all Pueblo children receive high drawing scores -- there is considerable individual variation.

The result for the North Valley kindergarten (Group 6, where all children who fell in extreme categories fell in Category II) was unexpected, since this group did not score particularly high in Total Phrases. But note that this was one of the groups for which the correlation coefficient between Total Phrases and Drawing scores was negative. The New Mexico Summer School (Group 7) was the only group which had children in all four categories, and therefore the most diverse population of students. In general, Table 11 confirms that there is considerable individual variation within groups as well as variation among groups. Individual trends as brought out by these data, however, would be more useful to teachers than to researchers. An unusually high proportion of children falling into Category IV, (as in Groups #1 and 4), for instance, probably indicates that the classroom instruction and/or environment is not contributing sufficiently to the children's development -- it is simply not reaching the children.

5. Results: Thematic Analysis

For both stories and drawings, we analyzed the thematic content. This was done simply by noting which characters, objects and actions appeared in the children's stories and drawings. (See analysis sheet, Appendix G.)

Table 12 shows the frequency of themes in the retold stories. In order to facilitate comparisons, we have drawn up Table 13, which shows only the most prominent themes, those which appeared more than 75% of the time (X) and the least prominent, those which appeared less than 25% of the time (-). It is evident that the groups differed in the thematic content of their retold stories. The most complete stories were told by the Keresan Pueblo children in their native language and by the San Diego children; both groups included most of the thematic material in their retelling of the stories.

'Horse' was the most salient theme for the sample as a whole. For the Tanoan Pueblo (English version)

Table 12. Frequency of Themes in Retold Stories

Theme	Keresan Pueblo K N = 6	Tanoan Pueblo K N = 13	Tanoan Pueblo K* N = 12	North Valley K N = 7	N.M. Summer School N = 19	Commune School N = 12	Keresan Pueblo Grade 1 N = 19	Keresan Pueblo Grade 1* N = 4	N.E. Heights Grade 1 N = 22	San Diego Grades 1 – 3 N = 22
Boy	50**	62	100	71	89	67	84	100	73	77
Doll	33	38	83	100	74	75	74	100	86	100
Horse	83	77	42	86	79	67	90	100	82	82
Moon	100	54	67	57	95	100	37	100	96	95
Rain	83	69	100	86	74	58	74	100	82	86
Med. Bag	0	69	92	57	74	92	42	75	73	73
Jewelry	33	38	92	86	84	92	74	75	86	77
Crying	67	69	58	57	74	84	53	100	68	91
Dreaming	33	31	50	29	53	58	16	75	68	50
Father	0	15	58	71	47	67	21	75	77	91
Mother	0	15	0	0	42	9	0	0	37	41
Sister	0	31	75	29	42	50	5	25	50	91
Brother	0	15	17	0	5	0	5	0	9	5
Indian	0	8	0	29	0	N/A	0	0	N/A	23

*These stories were told in the children's native language.

**This should be read: 50% of the Keresan Pueblo kindergarten children mentioned.

Table 13. Prominent and Scarce Themes in Retold Stories.

Theme	Keresan Pueblo K N = 6	Tanoan Pueblo K N = 13	Tanoan Pueblo K* N = 12	North Valley K N = 7	N.M. Summer School N = 19	Commune School N = 12	Keresan Pueblo Grade 1 N = 19	Keresan Pueblo Grade 1* N = 4	N.E. Heights Grade 1 N = 22	San Diego Grades 1-3 N = 22
Boy			X		X		X	X		X
Doll			X	X		X		X	X	X
Horse	X	X		X	X		X	X	X	X
Moon	X				X	X		X	X	X
Rain	X		X	X				X	X	X
Med. Bag	-		X			X		X		X
Jewelry			X	X	X	X		X	X	X
Crying						X		X		X
Dreaming							-	X		
Father	-	-					-	X	X	X
Mother	-	-	-	-		-	-	-		
Sister	-		X				-			X
Brother	-	-	-	-	-	-	-	-	-	-
Indian	-	-	-		-	N/A	-	-	N/A	-

*These stories were told in the children's native language.

X = frequency 75% or more

- = frequency less than 25%

horse is the only high-frequency theme that appears, and similarly for the Keresan Pueblo first-graders (in English), horse is one of only two high-frequency themes. The horse, for most Pueblos in New Mexico, is a high-prestige animal, and one that most people used to have. Today, horses are not as common, and they are scarcer in the Tanoan Pueblo than in the Keresan Pueblo.

In some cases, thematic material is probably omitted because the children lack not only the object in their culture, but even any concept and therefore label for it. Such seems to be the case with the medicine bag for the Keresan Pueblo children, when telling the story in English. The kindergarten children mentioned the bag not at all (see Table 12), while for the first graders the proportion was 42%. In contrast, 69% and 92% of the Tanoan Pueblo kindergarten children mentioned it (English and native language versions, respectively). It turns out that these children are not familiar with medicine bags either (they are Navajo items), but they converted the bag into a 'pottery' in their stories! In this Pueblo, a fair amount of pottery is made today; besides, the designs on the madicine bag as it appears in the drawings are similar to southwestern Pueblo pottery designs. In the Keresan Pueblo no pottery is made today at all.

For thematic analysis of drawings, we included drawings from art education classes being taught to Pueblo and Anglo teachers and aides, who were all teaching at Pueblo schools. The classes were read the story

(Pueblo version) while being shown the pictures, and were asked to both comment on the story and to make a drawing based on the story. One class was composed of personnel from the Keresan Pueblo school, but not the same Pueblo as our children's groups. The other class included personnel from three different schools, but all attended by students from one Tanoan Pueblo, again not the same Pueblo as our children's group. This group included four non-Indian teachers, who appear as a separate group in our analysis. The reaction to the drawing task was rather different in the two classes. The Keresan Pueblo adults took a long time to complete the assignment (one to one and a half hours), and their drawings showed on the whole extremely careful execution, with colors always solid and even the pencil drawings (no color) very detailed. In contrast, the Tanoan Pueblo drawings were fairly hastily done (half hour), colored ones were usually quickly shaded rather than solidly colored in, and more were done in pencil only than in the Keresan group. Six of the thirteen Keresan Pueblo adults drew what amounted to a 'complete scene' -- that is, the drawing included details such as a road, grass, plants, etc., and everything was colored in, no part of the page being left empty. None of the Tanoan Pueblo adults (N = 15) (or the Anglos) made this type of drawing. Five of the Keresan adults made what could be termed a 'symbolic' drawing. For instance, one such drawing showed the boy in the story sitting by the tree holding his baby sister, with his adventure on the moon 'passing in front of his eyes.' Another depicted the boy inside a house, in bed asleep, while on another part of the sheet he was on the moon with his doll. Again, none of the members of the other art class drew this type of picture. Clearly, the Keresan adults found drawing a satisfying and exciting medium. These differences may reflect the contemporary situation in the two Pueblos: in the Keresan Pueblo, traditional pottery is made and sold as a serious art; in the Tanoan Pueblo, pottery is no longer made in the traditional manner, but is made by a somewhat different technique strictly for the tourist trade. No doubt there are additional explanations for the striking differences in the drawings, but we have no information on this topic.

Table 14 shows the results of the thematic analysis of the drawings. (Themes or items which occurred only once in the entire sample were not included in the table, even if they were taken from the story pictures.) Cultural differences in themes are here more evident than in the themes occurring in retold stories. For instance, Keresan Pueblo children and adults were the only ones who drew the rug -- this is a Navajo rug which the boy in the story is lying on in Picture #3 (for accompanying text, see Appendix D) . This rug and the medicine bag are the only two objects in the pictures which have Indian designs on them. The medicine bag was also drawn mostly by Indian children and adults, from both Tanoan and Keresan Pueblos, even though as we noted for the textual themes, medicine bags are not part of Pueblo culture.

Table 14. Frequency of Themes in Drawings

Themes	Ker.P. K N = 6	Tan.P. K (Eng.) N = 12	Tan.P. K (Nat.) N = 12	Ker.P. 1st (Eng.) N = 19	Ker.P. 1st (Nat.) N = 4	Ker.P. Adults N = 13	Tan.P. Adults N = 15	N.V. K N = 7	N.M. S.Sch. N = 19	Commune N = 12	N.E. Hts. N = 22	San Diego N = 21	Anglo Adults N = 4
Boy	33*	83	83	79	100	85	93	43	79	58	95	73	75
Doll	17	58	58	84	100	38	40	29	37	33	71	36	25
Horse	33	42	25	32	75	46	20	0	37	42	29	45	25
Moon	0	42	33	16	25	54	20	0	21	14	19	32	25
Rain	0	17	0	5	0	15	13	0	5	25	20	5	0
Med. Bag	0	17	42	53	25	38	40	0	5	0	7	23	25
Jewelry	0	17	25	16	25	23	33	0	16	0	41	9	75
Tree	0	8	8	21	25	62	73	0	5	N/A	N/A	32	50
Father	0	0	17	5	25	8	0	17	0	0	0	14	0
Mother	0	0	0	0	0	8	0	0	0	0	5	5	0
Baby Sister	0	8	8	5	25	23	27	0	0	0	0	14	0
House	0	8	0	0	0	69	27	0	0	8	0	27	25
Grass	0	0	17	5	0	38	27	0	0	25	5	14	25
Bowl	0	0	0	0	0	0	0	0	0	0	0	14	0
Rug	0	0	0	11	25	31	0	0	0	N/A	N/A	0	0
Stars	0	0	8	5	25	0	13	0	5	0	0	0	0
Rainbow	0	0	17	0	25	0	0	0	0	0	0	0	0
Clouds	0	8	0	0	0	0	0	0	5	0	0	0	0
Sun	0	8	0	5	0	23	7	0	5	0	0	8	0
Unrel./ abstr.	17	0	0	5	0	0	7	0	21	0	0	0	0

*This should be read: 33% of the Keresan Pueblo Kindergarten children drew the boy.

(There is no rug in the Black version of the story, so that the two groups -- the Commune group and the Northeast Heights classroom -- which saw this version had no rug 'model.' Also in the Black version, the role of the medicine bag is taken by a huge piggy bank.)

The bowl was only drawn by Black children in San Diego -- in several retold stories, it was called "bowl of grits." (A bowl is depicted in Picture #1 in all story versions.) Another culturally related theme seems to have been the baby sister, who was drawn mainly by the Pueblo groups, but also by the San Diego children. The father was not drawn by any of the Anglo groups, while some members of Pueblo, Chicano and Black ethnic groups depicted him. Interestingly, the highest frequencies for jewelry/money occur for the Anglo teachers (jewelry, 75%) and the Northeast Heights first graders (money, 41%), although jewelry is also present in the drawings of Pueblo groups.

Some themes seem to be age-related: trees were drawn mostly by adults, and by the San Diego children and Keresan Pueblo first graders. The house was also depicted mostly by adults, and by the San Diego children. The house is in the second to last picture in the story, and this was the favorite scene drawn by the Keresan Pueblo adults. The only children seemingly interested in this scene were the San Diego group; this interest probably also accounts for some of the occurrences of 'baby sister' and 'tree' among the San Diego children, since both themes are present in the scene.

A few children and adults included items in their drawings which were neither mentioned in the text nor present in the pictures. These are the three items immediately below the line in Table 14 -- 'rainbow,' 'clouds' and 'sun.' In addition, some drew abstract drawings, or drawings entirely unrelated to the story. The largest number doing so were children from the New Mexico Summer School, where 4/19, or 21% of the drawings were of these two types.

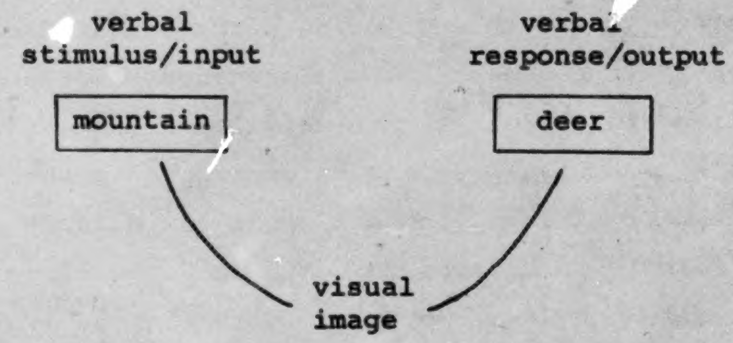
F. Word Association and Imagery Task

1. Introduction

The associational tasks developed for this study are rooted in a long tradition of psychological research. Sir Francis Galton was the first to use the word association technique in 1879; subsequently, C.G. Jung adapted the method to use in clinical work with patients. The technique was very popular in the early part of the century with experimental psychologists as well, and their normative findings are still valuable to the research worker interested in language.

In more recent times, tasks requiring associations have been used by individuals interested in bilingualism. Fishman *et al.* (1968) found that bilinguals associate and presumably store words according to the social domain to which they pertain. For example, a word association test was administered in Spanish and English using ten stimulus words, each of which referred to a particular domain. Bilinguals were instructed to say as many different words as the stimulus word elicited, and to do this as quickly as possible. Those words which dealt with the private domains of home and religion elicited more responses when administered in Spanish, while the job or school domain elicited more responses during the time limit in the English language version. This contextual use of language by bilinguals is also noted by Kolers (1968) in his work related to information processing in the brain. Using a word-association technique, Kolers found that 25% of bilingual responses to concrete or tangible stimulus words elicited similar responses in the subjects' two languages. Words referring to feeling did not elicit many similar responses in the subject's two languages, and Kolers suggests that even when they are similar, the bilingual has different contexts and expectations for each word. He interpreted this to mean that some words are more closely linked to the actual referent in external reality, while other, more abstract words are stored in terms of a more symbolic or internal image.

The use of word association, and later, imagery tasks with children and adults in the context of this investigation originated from a general interest in symbolic representation, the nature of which seems affected by social, cultural and linguistic variables. When the first version of this word association task was administered to a group of bilingual adults, some reported that they 'flashed' on an image as soon as they heard the input (stimulus) word, and then searched for a word to render that image in either of their two languages. This self-report encouraged us to explore further the nature of imagery processes and representations, which prompted an expansion of the word association task into one which explicitly requested detailed reporting of images evoked by stimulus words. This tendency to mediate between a verbal stimulus and a verbal response with an image can be expressed by the following model:



Most research with word association has focused on the form of the response by analyzing the linguistic variables, such as paradigmatic vs. syntagmatic and the popularity of response. We find that word association, when looked at in terms of content and such stylistic variables as occurrences of antonyms, synonyms and attributive phrases can provide an interesting basis for cross-cultural comparison. Findings to date seem to indicate that it is a promising technique for looking at the degree of acculturation independently of language dominance.

Patterns of responses may reflect cultural emphases either directly or indirectly. For example, when a Navajo associates the word "skinwalker" to the word *fear*, we are given direct information about culturally salient things for a Navajo to be afraid of. Or, in looking at the total associations to the word *mountain*, we may notice that Navajos tend to respond with words suggesting a presence in that immediate environment (e.g., rocks, pine trees, sagebrush) while the non-Indian respondents see the mountain from a distance (e.g., top, peak, blue). Such patterns of response may indicate, albeit indirectly, cultural differences in how certain phenomena or events are viewed and/or experienced.

2. Methodology

a) Adults

Though no adults from a Pueblo community were sampled, word association and imagery data were collected from ten Navajos and ten Crow Indians, and were compared to a group of ten non-Indian women students at the University of New Mexico. The age range for all participants is twenty-two to forty-two years. Both groups of Indian adults were involved in bilingual-bicultural teacher training programs.

Adults were approached in the classroom and asked to participate in a study about thinking. After they agreed to perform the word association and imagery tasks, the field worker promised to explain what the study was about in greater detail. Participants were asked to supply the information pertaining to sex, age, and language background requested at the top of the two-page response sheet. (See Appendix H .) The first part of the task was a word association test. Instructions printed on the first page of the response sheet were read aloud:

> As each word is read aloud, please write it in the appropriate blank in column A. Write your first response to the word in column B, and your second response in column C.

The instructions were re-tated, and an example given. Participants were reminded that a response in any of their languages was welcome, as long as it met the criterion of being among the first two responses which surfaced. They were told that words would be given fairly rapidly.

The twelve words for the association task were chosen to represent several domains: feeling (sadness, love, fear); cognitive (test, organize, thought); spatial (bridge, mountain, sea, space); and interpersonal (child, woman). Each word was repeated twice, and sea was spelled to differentiate it from see. The field worker, using a stop watch, allowed thirty seconds for each set.

When the word association task was completed, participants were asked to turn to the next page for the imagery task. Again, the printed instructions appearing at the top of the second page were read aloud:

> Please write down each word as it is read aloud.
> Then, close your eyes, register the image, and
> report what you "see" in as much detail as possible.

In the imagery task, the eight words used again reflected several domains: feeling, or abstract (marriage); cognitive (library, fantasy); spatial (sky, house, schoolbus); interpersonal (teacher, man). Each word was repeated twice, and participants were allowed ninety seconds in which to write their response before going on to the next word. Words were randomized for each different administration of the task.

b) Children

There were sixty-two children ranging in age from five to fourteen years, from Albuquerque (South Valley classroom), a Tanoan Pueblo, and the Navajo Nation who were given the association and imagery tasks. Only eight words, some of which were modified from the adult task, were used in the word association part. The domain principle was still in effect, however. The adult word fear was changed to afraid for the children; thought and organize were modified to think and fix, while test, woman, child, bridge and space remained the same. Sadness, love, mountain and sea were not used with children in the word association part.

Children were interviewed individually. They were introduced to the task by being told it was a sort of "game." They were asked their name, current age, birthdate and in some cases, questions aimed toward establishing their language background. Their responses to the tasks were taped in most cases, while in some they were written down by the field worker as the interview progressed. Instructions for the children were given by example. A typical instruction was: "I want you to say the first word you think of when I say a word. I might say 'shoe,' and the first thing you think of might be 'sock.' What would you say if I said 'table?'" The child usually responded with 'chair,' and when told that he understood the "game," was eager to play with more words. If the child did not understand, he or she was given more examples, and asked for more responses, until he or she understood the task. (Failure to understand occurred in only one case out of 64, and the responses of this eight-year-old boy were not used in the analysis.)

After all eight words had been administered to the children, they were asked: "Did you see any pictures in your mind when you said any of those words?" Irrespective of the child's response, he or she was asked for each word separately if he or she had 'seen' a picture and what it was. In this manner, it was generally possible to establish how many of the eight words elicited an actual visual image; moreover, this procedure prepared the child for the next part of the task.

For the image part, the children were asked to close their eyes and look at the picture inside their heads, and to tell the field worker what they saw. If the child did not seem to understand, or hesitated, the field worker typically gave an example: "When I hear the word 'dog,' I close my eyes and I see Phyllis, my friend's dog, lying on the front porch. She's wearing a red collar and barking. Now, what do you see when I say the word sky?" Only some of the words for this task were the same as the adult words: sky, house, teacher, man, and schoolbus. Two adult words from the first part, mountain and sadness, were used for the second part for the children. Library was changed to office. Since it became obvious immediately that children, in contrast to adults, do not spontaneously give more than a single word or short phrase (especially children under 10), they were prompted by such questions as "What else do you see?", or "Who is the man (woman, little girl crying, etc.)?", or "Whose house is it?" The words were always given in the same sequence in both parts of the task.

3. Results: Word Association Task

a) Adults

First and second word association responses of the adults were analyzed for differences between groups in the relative numbers of synonyms or antonyms. It was hypothesized that the Indian adults, as speakers of English as a second language, would be less likely to respond with association popular among native or very proficient English speakers. "Hate" is a popular response to love among native English speakers, as are antonyms for two of the other words ("happiness" to sadness; "man" to woman); such antonyms seem to acquire the force of verbal habit in English. Navajo responses, as predicted, were strikingly free of antonym responses to love, sadness, and woman; only one such response occurred ("man" to woman). However, the percentage of Crow responses that were antonyms (15/37, or 41%) was higher than that of non-Indians (11/47, or 23%). The proportion was especially high for the response "man" to woman, and accounted for 8/12 or 67% of the Crow responses to woman. The contexts of bilingualism are in fact different for the two Indian groups; this fact is thus reflected in their word association responses.

Word associations were further analyzed by assigning each response to one of the following content categories: inner state (subjective or feeling words), setting (physical environment), descriptive (attributes), interpersonal (people or relationships mentioned), evaluative (attitudes expressed), or symbolic (abstract, e.g., "cloud" as response to thought). A large number of responses in one category served to alert attention to patterns of response which might indicate cultural themes, though indirectly. Of the non-Indian responses to mountain, for example, 25% were symbolic ("beauty," "freedom," "peace") while no Indians responded this way (but see below). On the other hand, 12/20 or 60% of the responses of Navajos had to do with setting in that they named an object present in the actual physical environment of a mountain ("pine trees," "stream"). Non-Indians mentioned recreational activities, such as "picnic," "camp" and "climb," which were not mentioned by either Navajos or Crows.

In addition to indirect cultural indicators, there may be direct references to cultural features. For instance, 20% of the Navajo responses to mountain referred to the Four Sacred Mountains, which are important spiritual symbols in Navajo tradition. Thirty-three percent of Crow responses had to do with the traditionally important activity of hunting ("deer," "hunting").

These patterns suggest something of the different cultural meaning of mountain to these three groups; non-Indians seem to view mountains as places for relaxation (recreational responses and even the symbolic responses); Navajos are directly involved with mountains in daily life (they respond as if they were there, or with religious symbolism); Crows regard mountains as sources of livelihood.

Of the Navajo responses to fear, 3/20 or 15% could be called direct cultural indicators: "skinwalker," "witch," and "drunkard." The first two are traditionally fear-engendering because of their supposed supernatural power; that drunkards are feared unfortunately reflects a growing problem with alcohol on the Navajo reservation. (Children are constantly cautioned to avoid them.) Fear evoked patterns of response which might indirectly indicate differences in viewpoint among these three groups. Eleven of twenty or 55% of the Navajo responses were specific fear-inducers ("big dog," "snake," "dark" and the responses already mentioned), while among Crows and non-Indians, fewer responses (12/39, or 31%) were of this nature.

To the word woman, Navajos responded with "beads," "long skirt," "squaw," and "cook" (4/20 or 20%), which are descriptive of women in traditional Navajo culture. There were no direct cultural references from the Crows. However, 28% (5/18) of the non-Indian women's responses were words having directly to do with the changing role of women in American culture -- "liberation," "independence," "whole person."

Indirect cultural themes may be found by looking at the number of responses to woman falling in the interpersonal category (responses other than "man"): Navajos responded with terms denoting kinship roles ("mother," "aunt," "sister," 6/20 or 30%); Crows responded with "mother" or "clan" (2/12 or 17%); non-Indians gave only one "mother" response, and did not mention any other relationships.

The number and kind of Navajo responses to woman in the interpersonal, descriptive and attitudinal categories seem to indicate that Navajo women have a positive self-image in relation to their culture. The Crow women's responses, on the other hand, did not allow much of a glimpse into their views of themselves; the predominant Crow response was the antonym "man" (67%); the remaining four responses were "clan," "mother," "everything" and "hard workers."

Child was another word which evoked responses directly relevant to a particular culture. Navajos wrote "cradleboard" and "Indian." Differences between Indian and non-Indian attitudes toward raising children may be hinted at in contrasting responses of Crows and non-Indians. For instance, non-Indians gave "mine" and "own," while Crows gave "family" and "parents;" these responses may reflect the non-Indian involvement in the nuclear family that is not true of Indian culture, where the extended family is still important and child care shifts easily from one family member to another. More strikingly, the only setting response given by Crows was "home," while the only one given by non-Indians was "school;" and the only activity response given by Crows was "play," in contrast to the non-Indian "teach!"

The importance of family and friends seems to have a particular salience in Navajo culture, if their responses to love are any indication. Thirteen of twenty or 65% of Navajo responses fell in the interpersonal category; no Crow responses and only 3/16 or 19% non-Indian responses mentioned people.

If Navajos can be said to be interpersonally oriented on the basis of these word associations, then both Crows and non-Indians may be intrapersonally oriented, for their predominant responses fall in the inner state category (Crows: 8/12 or 67%; non-Indians: 11/16 or 69%).

Organize evoked a large number (67%) of interpersonal responses from Navajos ("group of people," "committee"). Crows and non-Indians both tended to respond with either synonomous verbs ("systematize," "file") or by naming things or events to be organized ("drawers," "lecture notes").

In examining these responses, we find that patterns cut across domains. For example, the predominance of words suggesting interpersonal relationships in Navajo responses occurred not only in response to stimulus words from the feeling domain (e.g., love), as might be expected, but also in response to a cognitive stimulus word (organize). That these and other thematic consistencies can be discovered in word association responses suggests that the technique can be used to elicit cultural, as well as linguistic information.

b) Children

Children were separated according to age and ethnic group for analysis of word association responses. The average number of items to which a child responded increased as age increased. (Table 15)

Table 15. Children's Word Association Responses by Age Group: Average Number of Items Responded to and Percentage of Paradigmatic Responses

Age Group	Average Number of Items Responded to (Out of 8 possible)	Percentage of Paradigmatic Responses
5 - 6 (N = 9)	6.6	54%
7 - 9 (N = 22)	7.6	58%
10 and older (N = 32)	7.8	69%

The percentage of paradigmatic responses, based on relevant answers only, also increased with age. In general, the proportions of paradigmatic responses and the amount of increase with age were comparable to results of other studies (Ervin 1961, Entwistle 1966).

Children's responses were analyzed for differences in form and content between age and ethnic group, and for patterns either very similar or different from adults.

Afraid was the stimulus word corresponding to the adult word fear. The dominant children's answer was the synonym "scared" (56%). Of those children who named an object of fear, 87% were Indian, and 75% were in the 7 - 9 year old group. Children in the youngest group mentioned fantasy objects: "ghosts," and "monsters" (63%). One Navajo child named "wild horses," a reality on the reservation where horses roam freely.

Space elicited words about space travel ("astronaut," "spaceship," etc.) from 53% of the younger children (5 - 9 years). Though space travel was mentioned by some adults, they gave predominantly attributive responses ("dark," "inner," "empty").

Think was used in place of the adult stimulus word thought. Only Indian children responded with sensory or process verbs such as "wish," "dream," "listen," "hear." Indian adults, too, used process verbs such as "wonder," "dream," and "remember," which were not used by non-Indian respondents.

The dominant response to woman among children, as among adults, was the antonym "man." Children otherwise responded almost wholly with synonyms, while adults had more varied responses. Forty-six percent of the Indian children said "lady," while only 18% of the other children did. Some children said "child," "baby," and "kids," which no adults did.

4. Results: Imagery

Both adult and children's imagery responses were analyzed by assigning each to one of the following categories:

1. visual: details of the image were described in purely visual terms, e.g., house, "masonry house, beige-colored walls, post fence surrounding it, in the mountains ---"
2. verbal: no visual component, e.g., house, "A house is a shelter full of love."
3. composite: both visual and verbal elements are present, e.g., house, "House with a roof and a yard -- both full of whatever it takes to make up a life."
4. constructed: an integrated image, constructed from several levels into a whole; symbolic, visual, e.g., house, "I am in a Victorian mansion, the walls are high and dark, there is a sea crashing outside; it is secure but makes me uneasy."

The percentage of each type of response for all the words together, for each ethnic group, was calculated and is presented in Table 16.

Table 16. Percentages of Imagery Responses of Navajo, Crow and Anglo Adults in Each of Four Categories

Response Category	Navajo Responses N = 68*	Crow Responses N = 53	Anglo Responses N = 70	All Adult Responses N = 191
Visual	50%	70%	33%	49%
Verbal	40%	21%	31%	31%
Composite	9%	8%	30%	16%
Constructed	1%	2%	6%	3%

*N is the number of responses. These results include the responses of 10 Navajo, 10 Crow, and 10 non-Indian women.

According to these percentages, Crow Indians responded the most visually of all the adults (70%). Navajos, less purely visual (50%) than Crows, nevertheless had more purely visual responses than non-Indians (33%). Non-Indians responded on the whole with more verbal components in imagery than either Indian group, as shown by the high percentage (31%) of verbal "images" together with the number of composite images (30%); verbal plus composite subtotals for Navajos (49%) or Crows (29%) are less than the non-Indian verbal element subtotal (61%).

The percentage of children's images for the words teacher, house and man which fell into the same categories are presented in Table 17.

Table 17. Percentages of Imagery Responses of Navajo, Pueblo and Non-Indian Children in Each of Four Categories

Response Category	Navajo Responses N = 34*	Pueblo Responses N = 48	Non-Indian Responses N = 89	All Children N = 171
Visual	62%	81%	78%	76%
Verbal	6%	8%	4%	6%
Composite	32%	10%	16%	18%
Constructed	0	0	2%	1%

*N is the number of responses. The responses of 12 Navajo, 16 Pueblo and 34 non-Indian children were analyzed.

These percentages indicate the overwhelming visual orientation of the children. Pueblo children had the most purely visual responses (81%), while non-Indians followed closely (78%). Navajo children had 62% visual images, with 32% composite (visual and verbal) images.

In comparing children to adults, children had a greater percentage of purely visual responses (76%) than adults (49%). Aside from the number of constructed images (which were rare in both groups), the least frequent among children was the purely verbal image (6%), while the least frequent among adults was the composite image type (16%).

As in word associations, direct cultural indicators can be found in the content of both child and adult images. To the word man, one Navajo child (9 years old) responded: "Jewelry on ... a necklace ... he's weak ... (How do you know?) He has those ... wrinkles ... a bun on his hair." She was clearly describing an old, traditionally-dressed Navajo man. House elicited two direct references to "hogan," the traditional Navajo-style house, from children. In response to mountain, a nine year old Navajo girl saw "a girl standing on top ... she's looking for sheep," which is a common activity for children on the reservation. A Pueblo kindergarten child said (also to mountain): "Indians. (What are they doing?) Shooting bows and arrows and the girls cook."

There was an interesting combination of cultural items in one adult Navajo response to marriage: "Velveteen and satin skirt, Paiute basket, medicine man -- white gown and a black and white suit going down the aisle." It seems the marriage ritual from two cultures fuses to form the image here. Another Navajo responded with: "Man and a woman sitting in a hogan eating," which might be construed as a direct reference to marriage, Navajo style, because of their presence in a hogan. Two older Navajos, however, mentioned the white dress, black suit, going-down-the-aisle marriage ceremony of the dominant, non-Indian culture.

In response to fantasy, dominant culture items such as "Disneyland" and "Tinkerbell" and other references to Disney films/phenomena appeared in several Anglo, one Navajo, and one Crow response. (There were only three Crow responses to fantasy.)

Children's images in response to house, schoolbus and mountain were interesting in that they seemed to view themselves as being in the named setting (compare Navajo adult word association responses to mountain). While adults often reported images of a house from outside, or made evaluative comments, 58% of the children said such things to house as: "My dad's laying in bed and my mom's washing dishes." (Anglo, seven years.) "People ... they're eating breakfast." (Anglo, eleven years.) They also gave lists of furniture: "Couch, TV, bed, chairs," -- things we might expect a child to use.

Child responses indicating inside views of schoolbus occurred in 49% of the total responses. Children mention the seats, kids sitting down, the driver, the fight in the back of the bus, and so on. Child responses to mountain (58%) showed a close-up view, an actual involvement in the setting. They mention, in various combinations, weeds, snakes, flowers, ants, worms, bushes, wind, rocks, sand, ground and pinon trees ... all things a child can experience directly.

The word association and imagery tasks in general proved to be fruitful sources for discovering cultural emphases, and cultural differences in how certain phenomena or events are viewed and experienced. We attempted to use the solicited drawings for the same purposes; however, success was minimal for that task. The primary difference in results almost certainly lies in the nature of the stimuli -- the subject matter to be depicted in drawings was extremely narrow and limited, while free association to a wide variety of words was asked for in the association tasks. A task comparable in visual 'free association' would certainly elicit many more cultural indicators. (Possibly a sheet with some lines already drawn could be presented -- essentially a 'picture-completion' task.)

Direct cultural indicators, or themes specific to a culture were numerous in both the word association and imagery tasks, especially among adults. Words such as 'skinwalker,' 'deer,' ' Four Sacred Mountains,' 'long skirt,' 'clan,' 'cradleboard,' 'liberation,' and even 'picnic' and images of hogans, a girl looking for sheep, an old Navajo man, and Indians shooting bows and arrows are certainly specific to the cultures of the respondents. On the other hand, direct cultural indicators in the drawings were few: rug and medicine bag with their Indian designs, Pueblo style houses, complete scenes which looked like the Southwestern desert environment (adults only) and the 'bowl of grits.' These exhaust the list; all except the 'bowl of grits' were already present in the pictures which served as models -- they are being called 'direct indicators' only because the Pueblo respondents tended to draw them more than others did.

Indirect cultural indicators were also evident in both word association and imagery tasks. In word association, responses of the different ethnic groups in many cases fell in different content categories. Thus, Navajos had high interpersonal content in their responses, as in their responses to woman and organize. Indians, children as well as adults, were the only ones to respond with sensory verbs such as 'wish,' 'dream,' to the words thought and think. Another example in this category were the contrasing Crow and non-Indian responses to child. In imagery, the groups differed in dominant response categories (visual, verbal, composite, and constructed). For instance, Crow adults had the highest percentage (70%) of purely visual responses among adults; they also exceeded the Navajo children, however, whose purely visual responses made up 62% of their total responses. Navajo adults had the highest percentage (40%) of purely verbal responses of any group. Perhaps related somehow to these adult results were the Navajo children's 32% responses in the 'composite' category -- this indicates that the Navajo children were the only ones showing any sizable verbal component at all, among the children's groups. These results from the supposedly visually rather than verbally oriented Navajo need further investigation. Indirect cultural indicators in the drawings were differences in the focus of interest. The Pueblo adults, for instance, depicted the scene with the boy holding his baby sister and a Pueblo house in the background more than any other group. The picture with the father and son was drawn only by San Diego children. The scene with the jewelry or money falling from the sky was drawn by two Anglo groups. Pueblo children's favorite seemed to be the scene with the boy and his doll riding the horse over the moon.

The word association and imagery tasks thus seem promising in the investigation of cross-cultural differences in subjective 'experiencing.'

G. Combined Results: Individual Profiles

In one classroom--the Tanoan Pueblo kindergarten--we were able to carry out all of the tasks and activities with the children. We wish to present these children's individual profiles in an effort toward delineating the interaction between functional learning systems and classroom methodology. This effort is preliminary and meant to be only suggestive of fruitful ways of looking at children's development and educational impact on it.

Table 18 shows the results from all tasks and observations for the Tanoan Pueblo kindergarten children. The search for patterns in these data turned up only one--namely that children who used analytical or mixed methods in Block Construction also received high scores in drawing. It is likely that this is a true correlation, since one would expect these two tasks to have some features in common. However, no other correlational patterns emerge. For example, one might expect the more verbally oriented children to spend more time with teachers, yet children with high scores in Story Retelling do not all prefer activities with teachers present. Similarly, neither high nor low scores in any of the other tasks are related in any simple way to children's preferences in terms of activities, or to each other. (That there is no correlation between Story Retelling and Drawing scores in this classroom was already shown in Section E 4 of this chapter.)

The significance of this diversity of course cannot be firmly established without comparable data from other classrooms. However, we have reason to suspect that it is due

Table 18. Individual Profiles of Tanoan Pueblo Children

Child	Observational Data: With Teacher			Observational Data: Primary Interest Area	Observational Data: Secondary Interest Area	Observational Data: Tertiary Interest Area	Block Construction: Method	Block Construction: Score			Story Retelling Score@			Drawing Score@			Word and Image Ass.**: Word Assoc.	Word and Image Ass.**: Imagery
	H*	M	L					H*	M	L	H*	M	L	H*	M	L		
Boy 1	X			Media,Ctr. Tables, Natv.Lg.	Large Blocks	--	Match	X			x		X		x	X	--	--
Girl 1	X			Ctr.Tbls.	Role Play, Natv.Lg.	Media	Mixed	X					xX	xX			7	7
Girl 2	X			Ctr.Tbls.	Media, Science	Natv.Lg.	Match.			X			xX	X	x		--	--
Girl 3		X		Ctr.Tbls.	Media	Reading, Science	Mixed	X				x		x			1	0
Girl 4		X		Ctr.Tbls., Natv.Lg.	--	--	Match.			X	x	X		X	x		--	--
Boy 2		X		Ctr.Tbls.	Reading, Media	Role Play, Natv.Lg., Other	Anal.		X				xX	xX			--	--
Girl 5		X		Ctr.Tbls.	Role Play	--	Match.	X				xX		xX			5	8
Boy 3		X		Ctr.Tbls., Lg. Blocks	Natv.Lg.	--	Match.	X				X	x		x	X	--	--
Girl 6			X	Role Play	Ctr.Tbls.	--	Mixed		X			X		X			5	4
Girl 7			X	Role Play	Ctr.Tbls.	Media	Anal.		X		x	X		xX			7	8
Boy 4			X	Lg.Blocks	Ctr.Tbls.	Natv.Lg.	Match.		X				xX		X	x	--	--
Boy 5			X	Lg.Blocks	Media	Ctr.Tbls., Reading	Match.	X			x	X		X	x		--	--
Boy 6			X	Lg.Blocks	Ctr.Tbls.	Natv.Lg.	Match.			X		X	x		X	x	--	--

@ For both Story Retelling and Drawing Scores, small x's indicate the English version of the story; large X's indicate the native language version of the story.

* Percentage of Time Spent With Teacher Present	Block Construction Score (8 possible)	Story Retelling Score, Total Phrases	Drawing Score, Cognitive and Artistic Combined
H = 60% or more	H = 7 or 8	H = 20 or more	H = 7.5 or more
M = 40-59%	M = 5 or 6	M = 11-19	M = 6.25-7.25
L = 39% or less	L = 4 or less	L = 10 or less	L = 6.0 or less

** For word association, the numerals indicate the number of relevant responses our of 8 possible. For imagery, the numerals indicate the number of words out of 8 possible that children reported images for; all images were purely visual, as defined in Section F 4.

to the nature of instructional procedures in this classroom -- children are encouraged to develop their own a approaches to learning. More thorough examination of such results from diverse classrooms of different levels could show whether individual diversity is maintained or 'leveled', and how this is related to instructional methodology.

Chapter IV

Discussion and Conclusions

This project is aimed at two levels of inquiry. A general objective is the cross-cultural examination of children's learning and thought processes, including their methods of symbolic representations. The second and more specific purpose of this project is a discussion of the education of Indian children. In this context, learning experiences of children in Pueblo communities were studied, and approaches to their schooling will be discussed in light of the findings reported above.

A. Words and Images

1. Introduction

The starting point of this work is a widely accepted assumption concerning children's cognitive efforts: humans of all ages are hard at work creating order, though frequently of a temporary kind, out of their complex and contradictory environments. Children's activities are particularly noteworthy in this respect as they are more overt and thus open to observation than those of adults.

The inward flow of sensations and experiences are organized by the brain in a variety of ways; some sense impressions are stored in long-term memory requiring recoding. The transformation of what is heard, seen or touched is dependent upon the skill of the human mind in presenting anew, or representing events as images, inner language, and as other forms of symbolic representation. It is difficult to ascertain the nature of inner cognitive processes; we are dependent to a large extent upon subjective reports as our source of information. Individuals do specify visual, verbal, kinesthetic and more elusive elements as components of their memory skills and thoughts. There are variations in introspective report among individuals in the same culture and between individuals from differing cultures in their reliance upon one or another aspect of these inner processes.

In children, the hard work of attaching meaning to experiences, and internalizing the results of their learning, changes throughout the developmental span. The shared tasks confronting all children, such as learning to talk, to walk and to play, are reflected in their cognitive strategies, but their strategies are also an expression of particular features of their culture. The changing systems of children's thought are molded by the tools available to their community; by the prevalent methods of physical and economic survival; by the language and visual symbols used by their people; and most importantly, by the ways in which nurturance and instruction are patterned in their society.

The culturally patterned variations of children's thought are now explored in fresh and hopefully more honest ways than was done in the past. The contribution of bicultural individuals is of singular importance in these endeavors. Velma Garcia (1974), a bilingual and bicultural Pueblo woman, reports some interesting observations concerning symbolic representation among Pueblo children. Children listening to the many legends of their people learn to represent these visually, Garcia conjectures, because they are not allowed to ask questions or verbally reflect upon what they hear. They are to say "æh hæ" only to acknowledge auditory attention. As a result, while the verbal representations of some of these legends are fairly simple nursery tales, the inner representations of the same legends, for older children and adults, are replete with highly abstract visual and symbolic articulations of cultural values. These kinds of observations lead to challenging but difficult questions concerning symbolic representations; questions which are an ever present theme in this inquiry and in many other efforts at cross-cultural research.

This fascination with the work of the human mind dates back to ancient times - the ways in which people store, elaborate and retrieve information intrigued Greek philosophers and they engage the interest of contemporary computer scientists. In this century, the study of covert processes has changed dramatically; ".. after more than 50 years of strict behaviorist avoidance of such terms as 'mental imagery' and visual, verbal, auditory 'images', in the past five years, these terms have come into wide usage as explanatory concepts in the literature on cognition, perception, and other higher functions." (Sperry, 1975, p. 53)

Developmental psychologists approach the issue of varying representations from the point of view of stages; verbal processes are placed in the context of an age-linked progression in Jerome Bruner's (1966) theory. "At first the child's world is known to him principally by the habitual actions he uses for coping with it" writes Bruner. (p. 1) This inactive stage is followed by iconic representation in his schema, and the third stage is that of the verbal-symbolic mode. Around the age of 7 or 8 the shift to language takes place, or as Bruner states it, "gradually, there is added a new and powerful method of translating action and image into language, providing still a third system of representation." (p. 1) The insight we have concerning the importance of verbal processes in thought is a result of the profoundly social nature of this complex process of communication and representation.

Piaget (1968) views differently the role of language as a representational process. He does not conceive of it as the central process of thought, which, once internalized by the child, dwarfs other representational processes. Piaget argues that abstract thinking included both imaginal and verbal processes. Paivio (1971) has summarized a large body of empirical work in his book Imagery and Verbal Processes; his own approach to these representational processes is closer to Piaget than to Bruner. Paivio defines these representational processes as follows:

> Images and verbal processes are viewed as alternative coding systems, or modes of symbolic representation, which are developmentally linked to experiences with concrete objects and events as well as with language.. In addition, it is assumed that chains of symbolic transformations

> can occur involving either words or images, or both, and that these can serve a mediational function in perception, verbal learning, memory, and language. (p. 8)

The notion of verbal and imaginal processes as parallel in their role of mental activity has received interesting support from recent neurophysiological research. In a popular article Sperry (1975) summarizes his work and that of many others, on left and right-brain functions. Through a careful study of patients with 'split-brains', new insights have been gained concerning the contributions of each of the two hemispheres of the brain. Sperry characterizes the right brain as 'talented' in spatial-visual abilities, while the left, and dominant, brain mediates verbal and mathematical functions. The way in which the processes of each hemisphere are described evokes a picture of a physiologically determined cognitive style; Sperry writes of the left-brain as "performing with analytic, symbolic, computer-like, sequential logic." (p. 31)

Words and images are complimentary methods of representation, and at times, an individual succeeds in fusing them in particularly productive ways. All individuals develop functional systems combining the differing representational systems. Our particular interest is in the impact of the environment in strengthening or masking the contribution of each half of the brain to the total intellectual functioning of an individual. When we compared children raised in differing social settings, for instance, Anglo children living in a commune with Pueblo children living in a small rural community, we found that they developd to varying degrees a reliance upon visual versus verbal representations. In addition to the home environment, schools, too, play an important role in shaping these 'functional systems' of thought.

The role of the schools in distorting an effective integration of various aspects of intellectual functioning is criticized by Professor Sperry. He writes as follows:

> Our educational and modern society generally (with its heavy emphasis upon communication and on early training in the three Rs) discriminates against one-half of the human brain. I refer, of course, to the non-verbal, non-mathematical minor hemisphere, which we find, has its own perceptual, mechanical and spatial mode of apprehension and reasoning. In our present school system, the attention given to the minor hemisphere of the brain is minimal compared with the training lavished on the left, or major, hemisphere. (p. 33)

The crucial role of language and its ascendance through development is well substantiated in empirical fact. However, Sperry raises the important issue: to what extent is this aspect of development a universal in human growth, or is it the by-product of the types of educational influences described by Sperry? In this study, we report cross-cultural variations in the reliance upon verbal methods of representation, and of fluency of words among children. The role of imaginal processes in intellectual performance varies among children drawn from varied ethnic backgrounds as well. The examination of styles of learning and teaching among Indian people leads us to believe that a broader integration of methods of learning than those we are familiar with in Western educational systems is possible, and that a synthesis of visual, observational and exploratory methods linked with "the training lavished upon the major hemisphere" is desirable in schools serving Indian and non-Indian children.

2. Cognitive and Subjective Imagery

The images reported by adults and children in this study varied greatly in vividness and range; some of the Indian adults spoke of events from their childhood with rich visual details added; others, Indian as well as non-Indian college students, relied upon graphic metaphors when describing some aspects of their thought processes. Children's word and image associations were of greater immediacy and vividness in their visual aspects than those of many adults. A few children, but a higher percentage of adults, reported associations which lacked visual details. The kind of individual differences mentioned here were first discovered by Galton, during the 19th century, and they have been substantiated in subsequent research. Of particular interest in this study were the thematic differences in images, as they revealed some cultural variations.

In this study, another aspect of visually-linked performance also showed group differences, namely the drawings of children. Boldness of line, use of color and space, and imaginativeness varied greatly among individual children raised in differing environments. Their drawings were examined for recurrent themes, and they were scored for cognitive and artistic features. The distinction between these two aspects of the drawings is analogous to a theoretical difference in imagery proposed by Forisha (1975). She presents evidence to support two distinct imagery traits, subjective memory and cognitive transformation, and proceeds to investigate these features in their relationship to verbal processes. (Her work bears some similarity to our own interest in verbal and visual processes, and consequently, it will be referred to repeatedly in the subsequent discussion.)

There are a wide variety of standardized tests used to assess the cognitive transformation component of imagery -- these tend to deal with figural information. In an influential study of sub-cultural variations in intellectual skills, Lesser, Fifer and Clark (1965) adapted a subtest from Thurstone's battery of Primary Mental Abilities Tests, and found ethnic variations in test profiles. For instance, Chinese-American children outscored subjects drawn from Black, Puerto Rican, and Jewish communities on tasks requiring spatial visualizations and transformations. In this study, the Block Construction task was used to elicit similar intellectual skills; children replicate a two-dimensional drawing by building the visual pattern into a construction of small colored blocks. Our findings are limited, as the task discriminates best among children in the age range 5 - 7 years, but these younger children show both individual and group differences, a trend that emerges in all the visually-linked tasks administered in this study.

While children's drawings are not often included in studies of intellectual variations, in this project we viewed the children's own activities (both spontaneous and specifically elicited) as the crucial component in the evaluation of visual learning and representation. Though the scoring of such products may be harder and even less reliable than the measurement of performance through an externally structured task, the results are very worthwhile. The importance of drawings, particularly in a cross-cultural st[illegible] is that children engage in this activity quite universa[illegible] as a significant aspect of their cognitive development. Fowles and Voyat (1974) summarize Piaget's view of drawing as part of the development of the symbolic function, in the following way: "The second behavior pattern associated with the symbolic function at this stage is the emergence of drawing. This again implies what Piaget calls assimilation, representation of reality by a child to himself on his own terms. It implies a schematization of reality, as well as an effort to imitate it" (p. 71).

We asked the question: are there differences in precision and in aesthetic qualities in children's drawings? Do they develop these skills more in a social setting where visual representations are valued by their culture, and where the development of verbal skills are affected by a different set of circumstances than is the case with middle-class, mainstream children? Drawing is a universally practiced skill, but is it of differential value to children raised in culturally divergent settings?

The highest drawing scores in this study were obtained by Keresan-speaking children. These children live in a visually rich environment as do other Pueblo children, but they, in contrast to some others, experience manifold language pressures, including schooling in their second, or weak, language. We interpreted their relatively high performance on drawings, in contrast with other children and in contrast with their skills in retelling stories in English, to mean that they rely heavily upon graphic skills as a significant channel of communication and representation. Monolingual children, on the other hand, rely increasingly upon language to meet these needs.

Buhler (1930) discussed the relationship between verbal and non-verbal aspects of development. He suggested that at an early age language supports drawing in articulating the visual field, but ultimately language defeats drawing as a mode of expression. It is possible that some bilinguals who have not had the opportunity to fully develop either one of their languages might not fit into Buhler's generalization. They may continue to use graphic means for expressing their communicative, affective and aesthetic needs in a society which emphasizes language as the best-fit process for these purposes.

The intricate functional relationships between different aspects of verbal and visual processing can be illustrated with one more example from this study.

The Story-Retelling Task was usually administered in the child's dominant language. There were two exceptions to this practice: in the Keresan Pueblo, where the language of instruction is English, the first set of administrations were in that language. In the Tanoan

Pueblo, a different language situation prevails -- the children are dominant in English, but they are in a bilingual program in which they are learning their Indian language, and so the task was administered in both languages. In both situations, when children heard the story in their weak language, they retold it somewhat differently from those who heard the story in their dominant tongue. When retelling the story heard in the weaker language, the proportion of scored phrases based upon the pictorial elements of the story was very high. It seems that the children could not remember those sentences which lacked visual representation in the illustrations, they could not process too much verbal input in their weak language. But when the language was supported by a visually depicted detail as well, their performance improved considerably. In contrast, among the children in California the retold stories revealed a strong orientation to the purely verbal aspects of One of These Days; they emphasized in their retellings the dialogues, and the verbally rhythmic aspects of the story. Here, the classroom supports a strong orientation to verbal interaction as revealed by the mapping and observations reported in Chapter III.

A different formulation of the way in which Pueblo children use words and images was given to the senior author in the course of an earlier effort, aimed at the study of children as poets. Stan Aiello at the Taos Pueblo Day School started an outstanding program in creative writing, and John (1972) describes the students' procedures:

> The girls still remembered how he started them off by placing pictures in front of the class to help them in their themes and associations. Soon, these external images gave way to their own visions of character and setting. In their recollections they "saw" most clearly the images giving rise to their short stories. One of the girls looking away from us and the tape-recorder could visualize the lined face of the old man, the main character in her story entitled the "Rain King."
>
> The poems and short stories alike tended to relate to Indian life, the imaginatively recreated past, invented tribes, and themes which reflected contemporary life. There was no great demarcation between drawing and writing as seen by the girls of the Pueblo.
>
> Often, on a quiet afternoon they drew, at times with a stick on the ground, while they thought of a poem, although most of their serious writing was done at school... I was struck by their reliance upon visual imagery as the core of their creative efforts. V. recalled how she thought of one of her stories on a specially warm spring day by craving moisture. She pictured a waterfall, and a village of Indians living in teepes nearby. She remembers how, in her imagination, the people looked. They were talking to each other but she remembers no sound as part of the preparation in writing this story. The process of drawing a story, adding each element as with a stick or pencil, may describe how these girls go about constructing their writing (p.4).

The variations in the interplay of verbal and visual processes found in this study call for further investigations in which the culturally patterned systems of cognitive approaches are the focus of study. It may be helpful to remind the reader of Cole and Scribner's formulation of this issue, first quoted in Chapter I: "We are unlikely to find differences in basic component processes, but socio-cultural factors play an important role in influencing which of possible alternative processes (visual or verbal representation, for example) are evoked in a given situation, and what role they play in the total performance." (1974, p.197)

3. Verbal and Imaginal Processes

In the previous section the nature of symbolic representation was explored with the primary emphasis placed upon visual processes. The same issues are examined in the following pages, but with greater emphasis placed upon the role of verbal components in functional learning systems.

Paivio's (1971) formulation of the interaction between imaginal and verbal processes has been influential; he sees them as two "alternative coding systems" or; "Stated differently, both symbolic modes are readily aroused and can be functionally useful when the situation is relatively concrete, whereas verbal processes will be definitely favored when the situation is relatively abstract. Many situations [are] likely to involve an interaction of imaginal and verbal processes..." (p. 9). In an effort to gather data relevant to Paivio's formulation, Forisha (1975) designed a study aimed at examining age trends in the interaction of these two representational processes. She asked: "Is there a relationship between imagery and verbal ability? Does the nature of the relationship change with age?" (p. 260). She found that among younger children there was no correlation between the two processes, while a low positive correlation exists between verbal and imaginal test performance among children nine years old and older.

In our study we examined intercorrelations of verbal and drawing scores obtained by children in the Story-Retelling Task. The first finding is quite similar to that reported by Forisha; there was no statistical relationship between the verbal scores (total number of phrases) and the drawing scores (pooled artistic and cognitive scores). Some examples of these coefficients are: $r = +.08$ (N of 48 Albuquerque children) and $r = +.07$ (N of 38 Pueblo children). A somewhat different result is obtained with children above nine years of age: in this group, $r = +.36$ (though the N is only 11 children). The trends presented here are based on small samples, but the fact that they reflect the same overall picture as that reported by Forisha (1975) increases the possibility of their accuracy.

In our study, these trends are complicated by the finding of group variations in the patterns of intercorrelations. We found that although among the 5-8 year-old children in general there was no relationship between the two sets of scores, an exception has to be made for a group of upper middle class Anglo children (New Mexico Summer School) who are characterized by an unusually well-developed verbal capacity for their age range ($r = +.43$, $p < .025$, $N = 19$). A reverse pattern emerges among children who do not seem to have strongly developed visual skills--for instance, the children from the New Mexico Commune (See Table 10, Chapter III) showed a negative trend in the correlation ($r = -.26$, $N = 12$).

These patterns are not easy to interpret; Forisha suggests, in line with Paivio's theoretical analysis, that verbal processes play an important, although complex role in the interrelationship of differing symbolic representations. Most developmental theorists postulate a later development of verbal abilities than imaginal abilities; Forisha finds that some of the results of her study support that assumption, although she finds no evidence of the fading out of the iconic mode as verbal abilities improve, as suggested by Bruner's schema. To quote: "The conclusions drawn from the data in this study are in accord with the theory presented by Paivio (1971) and Piaget (Piaget and Inhelder, 1971). It appears that verbal and imaginal processes do represent separate and independent traits which develop in parallel fashion. Furthermore, it is clear that the imaginal process does handle symbolic figurative information and continues to develop beyond the primitive level.... Finally, one might find further support for Bruner's work in the importance of language skills across all age levels... Whereas verbal ability appears to emerge later than imaginal abilities, it appears to be more closely intertwined with all types of cognitive performance" (pp. 266-267).

Our own data in general support Forisha's argument. We found that among the 9 year-olds and also some of the 7 - 8 year-olds, there was the beginning of a trend toward a positive correlation between verbal and visual representation, and that this was also true among a younger group

(5 - 6 years) whose verbal abilities are unusually well developed for their age. The trend toward a negative correlation among groups who scored low on visual representation is difficult to explain. It may be that for some reason these children concentrate their efforts on the mode (verbal or visual) that is more natural to them -- the reason that they do so probably lies in community and classroom variables which at present are obscure. In any case, such a trend should be further investigated with larger numbers of children and more thorough delineation of community or family and classroom variables.

Currently, educational practice is geared to speeding up verbal development, and ignoring spatial and imaginal processes. Our findings seem to indicate that verbal development is linked to certain culturally patterned experiences as is the development of spatial and imaginal processes. With most children, regardless of their cultural background, visual processes are minimally stimulated in school. And thus, language overshadows, and eventually drowns and suppresses, imaginal processes in most, though not all, children.

The general effects of the culture and of schools are powerful, but many creative people rely upon their "right-hemispheres" for much of their productive thought, in spite of educational socialization. Ann Row (1951), among others, has found that many graphic artists, biologists, architects and experimental physicists make extensive use of visual imagery in their intellectual labors.

There is evidence that Indian children excel in imaginal and spatial skills, if they are raised in their tribal communities (Bland 1970 and 1974, Dennis 1942 and many others). All these children may well score higher in the visual mode for the same reason that we hypothesize children in this study did -- namely, the presence of a distinctive artistic tradition readily accessible to them throughout childhood. However, this does not rule out the possible presence of a verbal tradition resulting in considerable ability also in verbal expression. Dumont (1972) and Philips (1972) have presented evidence that this is so, and in our own study we found the Keresan children extremely proficient in their own language. Yet, most verbal tests show Indian children scoring low, even those whose native language is English. For those Indian children being raised in tribal communities, whether under English-speaking, native language, or bilingual conditions, the variables involved in verbal abilities may be much less accessible to researchers of the 'middle majority' culture than are the cross-culturally more similar visual abilities.

In schools, the intellectual gains to be made through the educational development of imaginal abilities are frequently ignored by teachers of Indian children. Moreover, existing verbal abilities are also ignored except by a few far-seeing teachers. One example has already been mentioned -- that of Indian children's poetry in combination with drawing and painting (John 1972). Navajo native poetry is among the most well-developed and beautiful in the world, and those teachers who encourage English-language poetry among Navajo children have discovered that this specific verbal mode is not alien to the children, who otherwise have been characterized as 'silent.' Aside from these exceptions, Indian children are seen as deficient in the most valued skill, the English language, and schools tailor their programs to the objective of increased proficiency in English in the style of the middle class Anglo child. As a result of this study, we are more convinced than ever that alternatives to such a single and overriding objective must be found.

B. Some Issues and Debates in Indian Education

1. Tradition and Change

In some reports written with expertise a view of Indian education is presented which fails to take into account both the complexity of contemporary life-styles in Indian communities and the depth of experience relevant to education among Indian adults. A recently commissioned report on language policy for Indian schools exemplifies this problem:

> The great difficulty of Indian education in our mind springs from the fact that the school is attempting to educate Indian American children for roles which are not filled by their parents (or anyone else they are likely to observe at length) and to educate them to deal with tasks and opportunities which exist only off reservation or on a hypothetical, transformed reservation of

> the future. (Francis 1972, p. 60)

This presentation of Indian life is misleading on several accounts: it overgeneralizes by ignoring large variations among different reservations, and it ignores the extremely rapid changes in the life of bicultural individuals, such as the expanding horizons of job and educational opportunities that Indians are currently taking advantage of. A rather different view of a framework for education in Native American communities is presented by the Indian scholar Dave Warren:

> A better understanding of the fact that American Indian cultures are changing [is needed], that American Indian life is dynamic and not static: Examples of Pueblos' self-determination in civil rights discussions, the Zuni program, the emergence of Navajo nationalism, demonstrate change is occurring; but that change must take place at the tribes' own pace and discretion. However, even with change there is still a deep-rooted traditional identification. Too often, customs and practices are viewed as symbols of static tradition, when they should be seen as signs of cultural integrity. (1974, p. 14)

These aspects of contemporary Indian life produce a vital and exciting environment in which to fashion educational change. However, the dynamic, and at times, contradictory trends they represent contribute to an atmosphere of debate and controversy among tribal representatives. In educational planning, one can observe occasionally a polarization of points of view between those who emphasize the primacy of English language instruction and acculturation and others who stress educational efforts which build upon Indian traditions.

Neither of these alternatives, if considered in their purest forms, reflect accurately the actual life-styles among bicultural Pueblo individuals. The children who are raised in the Rio Grande communities, those whom we had an opportunity to work with, are not isolated from mainstream society. They are familiar with 'role models' who possess skills which are valued in the majority culture, but they are also part of the traditional life of the Pueblo and participate in the customs and practices. Consequently, they daily experience both Indian and non-Indian cultural traditions.

The challenge of accomodating schools to 'future shock' as well as insuring that the values of cultural integrity and continuity are reinfoced by the schools is a very difficult one to meet. A broad range of expertise, both within and outside these Indian communities, has been mobilized towards meeting these goals. Of particular importance is the training of young Indians in higher educational institutions today who are preparing for careers in education. To them, the contradictory aspects of schooling are a source of both pride and worry. They and their elders worry that too many innovations in education might harm the children who are currently in the schools.

Teachers, school board members, parents and tribal officials perceive the school as the major institution which prepares the Indian child for the demands of the mainstream society, while the home and the community are the institutions which keep the child Indian. Complete separation between these two facets of the life of bicultural individuals has resulted in much unhappiness in the past. But then, what degree of integration there should be between school learning and home learning, school language and home language so as to result in the most benefit to children is an extraordinarily difficult question to answer.

Many of the individuals interviewed in this study addressed themselves to these issues. They are part of the growing group of bicultural Indians who, for the first time, have some power in making choices of consequence to the future of their communities. For the first time also, there are a significant number of bicultural individuals who participate actively in both traditional and modern activities and organizations, a reality which is not fully appreciated by non-Indian experts who are called upon to help shape Indian education.

At the beginning of this study we tended to make similar mistakes. We underestimated the expertise of Indian educational specialists and non-professionals and we failed to recognize the complexity of choices they are confronted with. We were not prepared for the intensity with which representatives of Pueblo communities scrutinize the intentions and plans of 'helpful' non-Indian experts. In time, we have come to recognize the value of the lengthy process by means of which educational decisions are made in Pueblo communities. We witnessed impassioned debates, we sat through meetings which lasted into the night, and we were astonished at how many different people participated in school board meetings -- they ranged widely in age, previous experiences, and amount of schooling.

The growing sophistication of school board members and their Indian advisors leads them to an increased awareness of the limits of contemporary knowledge. In contrast with non-Indian society, where the educational vogue of the moment advocated by a specialist can become popular overnight, in tribal communities, partisans of educational change have a much harder time. They have to be informed and persuasive, but they also temper their opinions with respect for the beliefs and attitudes of Indian elders.

The way educational decisions are reached in Pueblo communities is quite different from what we are accustomed to in the mainstream of American society. The frequently lengthy debates are carried out within an old tradition, which McNickle (1972) labels as "alternatives to 'inevitable' choices." He speaks of the importance of "individual autonomy which permeates and vitalizes Indian society almost universally" (p. 14). The resistance to centralized authority, which is a common theme in Indian decision-making, is revealed in these school board meetings. But these meetings also demonstrate many of the influences of contemporary non-Indian society: the debates are an expression of the delicate balance among diverse traditions.

In observing the way in which agreement was fashioned and tested in Pueblo society we recognized the profoundly bicultural reality of these communities.

2. Bicultural Education for Pueblo Children

In the best of the classrooms of Pueblo day schools similar qualities of autonomy and diversity are revealed. The young children who come to school on the whole are confident and self-sufficient. One of the Pueblo staff members on this project was struck by the difference in independence and maturity between the children from her Pueblo and those in the University's day care center. She felt that the most important difference between these two groups is the sense of responsibility that characterizes the Indian children in their interactions with teachers, peers, and even toys and learning materials, while non-Indian children need more discipline, coaxing and support. Among the Pueblo children, this attitude is transferred to intellectual tasks as well.

But this confidence and self-sufficiency can be easily destroyed if Pueblo children are sent to schools where they are seen as inadequately prepared, or deficient in important skills. Some teachers are convinced that there is but one way in which academic success can be achieved, and that verbal learning is that avenue. The atmosphere in the classroom and the methods used to work with children is of crucial significance to the education of Pueblo individuals.

Traditional education has never led all children to learn the essentials. The proportion of Indian children who have been able to develop in this context is less than the proportion of Anglo children. Currently, some new programs are being attempted to help decrease the achievement gap between diverse groups of children. Usually, such a program is applied across the board: all children in a school, or all children in a classroom. Yet, logically, there is no basis for assuming that a new program will help all children to learn better. In some schools an attempt is being made to diversify instruction -- materials and approaches are varied -- so that children can learn in ways which are most comfortable for them. In this study, several processes of learning were described, and diverse modes of symbolic representation were mentioned. In their development of informal classrooms, some teachers already base their strategies on such theoretical knowledge as is available about children's diverse intellectual and affective development; many others however are mainly pragmatic in their efforts at insuring a diversity of opportunities for learning.

In the Pueblo day schools, we saw some outstanding examples of informal classrooms. These were not simple adaptations of the British or Eastern models; the classrooms in which we observed children at work revealed important differences from other classrooms in that they reflected features of Pueblo traditions, and incorporated to some extent Pueblo life-styles. The Tanoan Pueblo kindergarten was an example of such a classroom. The children retained their individual approaches to learning, yet assimilated both 'academic' content and process.

An examination of the fit between the school and the nonschool environment requires a brief summary of the socialization of Indian children in these communities. (A fuller description was presented in Chapter II.) In contrast with urban children, those growing up in the Pueblos live in a safe environment which they can explore freely. They are members of busy, densely populated villages in which their contacts with nature and with people are manifold. These children are not isolated from neighboring non-Indian communities; many of their relatives work in the large towns closeby, some of the older siblings of these children attend school with members of other ethnic groups, and the children participate gleefully in family shopping expeditions to Albuquerque and Española. The children are exposed to two languages: they hear English in many places, they watch television, and they are taught their Indian language (though the role of the native language varies from community to community). It is likely that many of the important experiences described by our interviewees are still significant in the lives of children now growing up.

The sense of identity of Pueblo children, their 'rootedness,' and their self-confidence are probably the result of some of these aspects of their up-bringing. They bring these attitudes to school, but unfortunately, many schools do not seem to recognize these strengths. Some schools and some teachers happily do respect the Indian child's identity, as expressed by this Pueblo teacher:

> I try to build on the good things that they can do. Really praise them for something that they do, you can just see it leading to something else. By the same token, if you get mad at one thing you just sure enough see that it blocks off something else you try to do later on. ... I think you have to recognize the children as individuals, their needs and what they have with them to begin with already. I don't think that you can come into a classroom and sit the children down and begin on one lesson on this page and scrape through everybody in this kind of situation. I think Indian children need a lot of freedom, by the very nature of their layout of the villages, their open spaces and stuff, they need a lot of freedom, they need to be recognized as individuals and I think they need to be respected for what they already know and not ... be so anxious about what you can put into them.

In schools where this kind of attitude exists, children continue to be independent and responsible individuals; the school does not precipitate a rift between home and classroom -- it becomes part of the community.

In one of the Tanoan kindergartens these connections were particularly striking: the flow of life in and out of the classroom was linked to the flow of life in the Pueblo. Parents walked into the school any time during the day, even workmen visited during their coffee break. The different adults who visited contributed to the childrens' store of experience: the Navajo-speaking wife of one of the construction workers shared with the kindergarteners her skills in weaving and cooking, even though she and the children had no common language.

In this and some of the other Pueblo classrooms, bicultural education ceases to be a slogan, an idea; it is becoming a reality. The informal structure chosen by some of the schools and teachers lends itself to the children being themselves: an environment is created where their interests are respected and their skills are expanded. The rooms have relevant curriculum materials; there are records of Pueblo music, and many of the children engage in traditional dancing; Indian food is served sometimes for lunch; and the boys and girls role-play Indian activities, such as events at craft fairs and traditional ceremonies.

However, the crucial transformation of a generalized informal model into a bicultural Pueblo classroom reaches beyond the availability of culturally relevant materials, or the participation of experienced and caring teachers and aides in the education of pupils. It consists in a distinctive social network in these schools. The presence and involvement of diverse individuals is as important here as the availability of many kinds of learning experiences. The school reflects the profoundly social nature of the Pueblo community. The use of informal education shaped into a Pueblo model brings home a recurrent lesson learned by observers of Indian life: native people frequently select some aspect of the dominant culture for their own purposes, they use newly acquired skills or concepts in support of their traditional society. The Pueblo bicultural classroom is an example of this trend.

C. Summary Statements

1. Learning Styles

The slowly evolving methods humans use in organizing stable perceptions and categories out of the 'buzzing confusions' of infancy are difficult to specify. The development of a descriptive framework for the diversity of learning processes needs to be based on human cognitive efforts rather than data gathered in research on animals. However, neither the psychometric method nor observational research are sufficient by themselves, or even in combination. Description and interpretation by the learner of his or her own processes, such as Piaget tries to elicit from children, and we have tried to elicit in this study from adults, is also necessary. In this study, we have made use of all three methods to begin the development of a framework; we have specified three important processes of learning, none of which can be explored effectively through the use of any one method. (Chapter I; Chapter III, Sections A and C; Chapter IV, Section A)

2. Process Measures

a) Mapping

A promising technique used in this study for the examination of classroom interactions was mapping, which yielded useful information about how children used their learning environment and about changes through time. This procedure was found by teachers involved to be valuable as an aid in improving the organization of their classrooms and in working with individual children who did not seem to gain much from the instructional process. It could easily be made available to other interested teachers. (Chapter III, Section D)

b) Learning Experience Interview

In this study, the use of interviews concerning learning experiences was of particular help in specifying some aspects of Pueblo socialization and educational practices. We found that collecting information from learners about learning was fruitful: adults can describe the ways in which they memorize, or study, or get new ideas; adults can describe what they were taught as children and by whom, and what aspects of their early learning are still of significance in their present lives. The interview schedule developed was also used in one workshop setting as a stimulus to thinking and talking about learning in schools; the participants 'interviewing' each other found the process very helpful. (Chapter I, Section D; Chapter III, Section C)

c) Story Retelling and Drawing

The story retelling technique developed by the principal investigator in a previous study was here expanded to include elicitation of the visual representation mode as well as the verbal. The technique was found to be an easy and natural way to obtain examples of children's drawings. In addition, the utility of this measure for eliciting sequential speech in two languages (and therefore its potential as a bilingualism measure) was explored. (Chapter III, Section E)

3. Group Differences

Differences between Indian and non-Indian children were found in this study just as they have been found before. In our interactions with Pueblo children, we found them remarkably self-confident and independent at a very young age; this impression was supported by interview data from Pueblo people who had experience with both Indian and non-Indian children. Pueblo children were found to excel in visual expression; the younger children showed a slightly higher interest in imitating adult models (in their role play and in their enacting of ceremonial dances) than did non-Indian children. Typically also, we found Pueblo children's verbal expression in English not to be as sophisticated as that of non-Indian children. All of these patterns can be linked to the nature of Pueblo communities and the children's place in them. Moreover, it was obvious that in those classrooms where these patterns were recognized as strengths and were built upon, other, more traditional 'school-learning', including verbal growth, was also successful. (Chapter II, Section A; Chapter III, Sections D, E, and F; Chapter IV, Sections A and B)

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APPENDIX A

School ______________

Name ____________________ Date __________ Time __________

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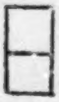

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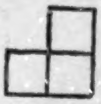

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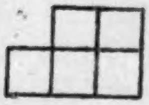

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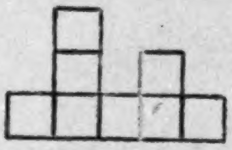

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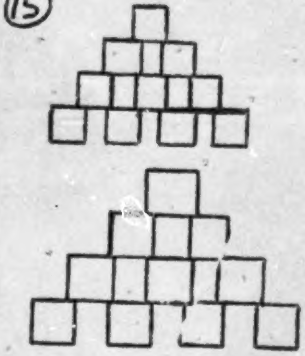

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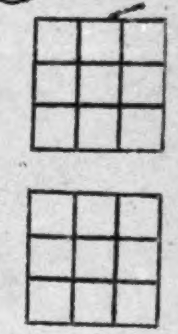

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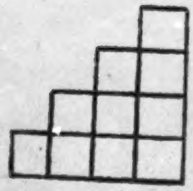

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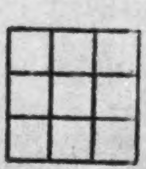

APPENDIX B

July 1975

Interview on Learning Experiences*

University of New Mexico

Vera John, Helgi Osterreich, and Peggy Lazarus

Central Topic: The focus is on the nature of learning, what it means to different people, and the mental processes involved.

Specific Topics: These are topics for discussion which will make it possible for people to talk about the central topic in reference to concrete situations. They may be considered in any order preferred, except that "Language Background" should come before "Learning."

Topic I. Language Background

a) Language first spoken as a child
b) Language spoken in school (both elementary and high school)
  1) In classroom
  2) On playground
  3) In dormitory (where applicable)
c) Language spoken at home
  1) As a child
  2) Now
d) Language used most frequently now
  1) With family, relatives
  2) At work or school
  3) Estimate which one is spoken more often
e) What language used for thinking (one most of the time; different language according to topic or situation?)
f) Other comments about language or languages (opinions on knowing two languages; learning of two languages; future of native language)

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*This interview schedule was produced as part of work done under HEW Grant Number NE-G-00-3-0074, "Learning Styles Among Pueblo Children."

Topic II. Learning

a) What is the word or words for "learning" in your native language? Situations that this word or words can be applied to - e.g., could use it for a child 'learning' to cook, or to plant? For 'learning' to read? What other situations?

b) Is the Indian idea of "learning" different from the English? How is it different?

Topic III. Home Learning

a) How learned to do tasks in childhood? Did someone teach them; who and how? Learn by watching and then doing? Try to discuss this with respect to specific activities - cooking, farming, weaving, pottery, etc.

b) How learned about Indian ways - was it by direct instruction, through stories, watching elders, combination of these, others?

c) In what areas (outside of school) are you still "learning"?

Topic IV. School Learning

a) Particularly difficult, and easy things in elementary school, and high school. For difficult things - why were they difficult; how did you try to do them? For easy things - what made them easy; how did you do them?

b) Relationship with teachers and others in school. (Memorable teachers or other persons; why? Any people who particularly helped you; how?)

c) How school learning and learning at home were similar or different.

d) Was writing particularly easy or difficult? Were you asked to do a lot of writing?

Topic V. College Courses (Now or Recent); Other Schooling After High School, As Adults

a) Which ones hard, easy; why?

b) How do you study? From textbook, notes, etc.?
    1) Do you ever "see" writing from book or notes in your mind?
    2) Do you ever "hear" lecture by teacher later in your mind?

c) How do you study for a test?
d) Prefer to write a report or take a test?
e) Prefer to listen to lecture, or some other method of learning the material? (Discussion groups, reading, practical experience?)

For people who are now or have been involved in teaching or in working in education:

Topic VI. Relationship Between Home and School in Personal Experience

a) Differences between non-Indian teachers and yourself.
    1) In teaching specific things - reading, math, etc.
    2) In behavior towards children and theirs toward you.
b) Do you think that there are Indian ways of doing things that could be used in schools? What are they, and how should they be used? Are any of these things being used by you or others you know of?
c) (Only if have taught in different places.) Do you see differences in how children approach learning in school - Indian children from different tribes, Anglo and Chicano children? How do they differ?

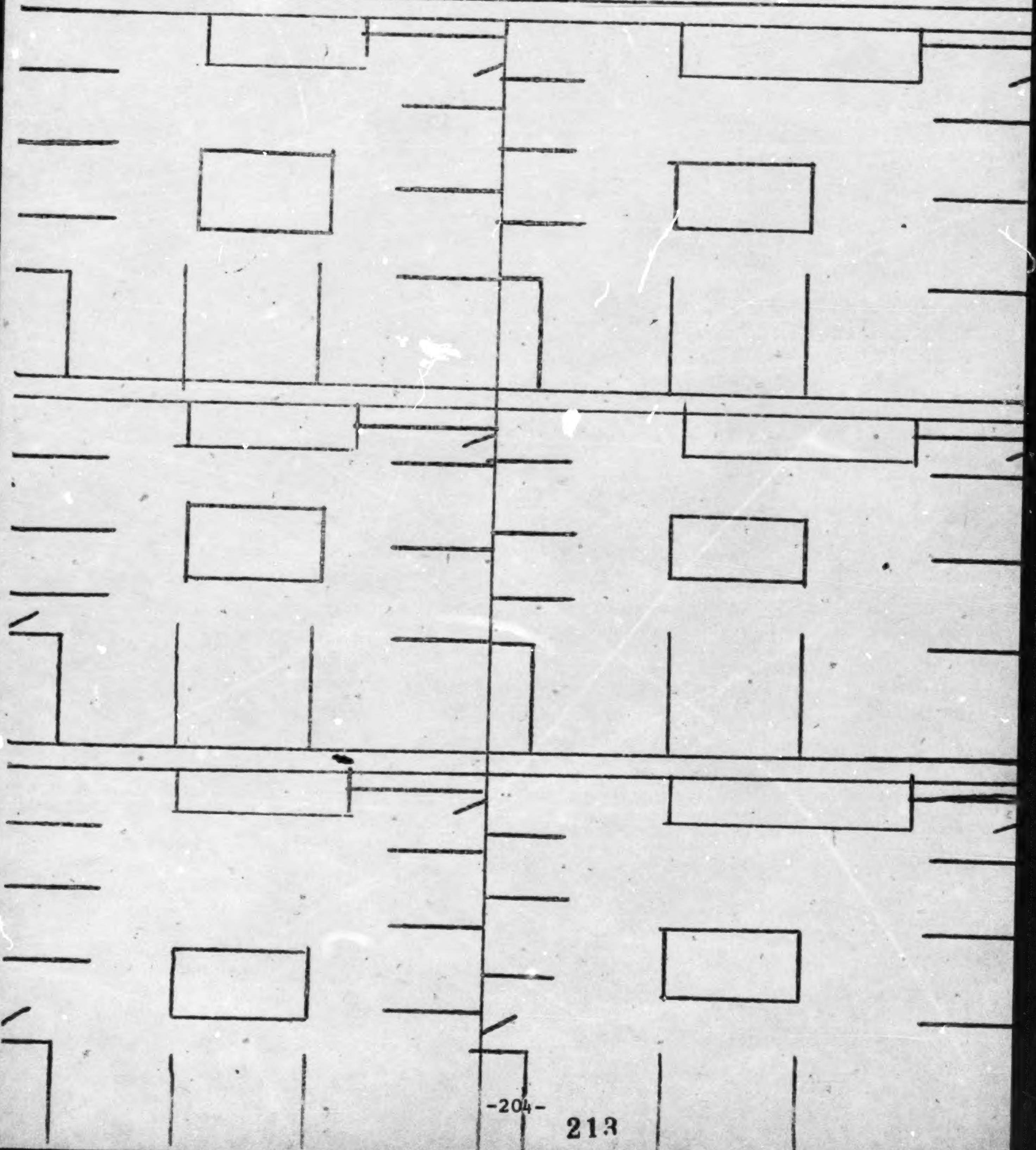
APPENDIX C

DAY SCHOOL-KINDERGARTEN

Name of Observer ________________

Date_______ Time______________

	Girls	Boys	Total
# of Children	_____	_____	_____
# of Adults	_____	_____	_____



APPENDIX D

ONE OF THESE DAYS

Page 1. "What's it like on the moon, Daddy?" James asked.

"Why it's cool and clean as a country rain on the moon. And there's lots and lots of tall grass. Every child has a room of his own to sleep in.

Page 2. When a boy gets to be six years old, his daddy buys him a pony with a shaggy black mane. He rides it every day. And on Sundays he gallops the pony all over the moonlight."

Page 3. That night James lay on his rug and looked up at the moon.

"I'm the only one awake," thought James. "Me and my doll." He hugged the doll and whispered in his ear. "One of these days, doll, one of these days we'll go to the moon."

A small cry floated across the room. Uh-oh. His baby sister was awake too. Mother went to the crib, and said, "Hush baby, hush baby."

Page 4. James fell asleep to his mother's voice. Soon he was dreaming. He dreamed that he and his doll were on the moon. It was raining. James and the doll walked around in the rain.

The rain stopped.

Page 5. Now silver and turquoise began to fall from the sky. It landed in the tall grass without a sound.

"Hooray," shouted the doll, and he and James ran from place to place, stuffing their pockets.

Page 6. "Oh, dear, oh dear, oh dear," said the rag doll. "Where will we put it all?"

"In me," said a voice. "Fill me up."

They turned around and saw an enormous medicine bag. James and the doll climbed the tree beside it and emptied their pockets into the bag. Clickety, clickety, clink.

"More, more, more," grunted the bag. "Fill me up."

Page 7. Finally there was only one piece left. The doll clutched it in his hand.

"More," grunted the bag.

The doll began to cry. "I'd like to keep just this one," he said in a very small voice.

"Don't cry," James said. "You may keep it."

Page 8. Now in his dream it was Sunday, the day of his sixth birthday. The little pony which his father had bought him was waiting quietly for him by a big tree. James climbed on the pony and put the doll in back of him.

Soon he and the doll were galloping through the moonlight.

"Faster!" cried the doll, and suddenly he burst into tears.

"What's the matter?" shouted James. "I thought you wanted to go fast?"

The doll cried louder and louder.

Page 9. But when James turned around, it wasn't his doll on the seat behind him. It was his baby sister.

"Hush now," said James. "Don't cry. Please don't cry." And then James woke up.

Page 9 cont'd. Even in his dream he had heard his baby sister. She was still crying. Mother had moved the baby outside and had gone back to sleep.

James tiptoed outside and picked up the baby. "Hush baby, hush baby," he said. "If you stop crying, I'll take you for a pony ride on the moon, one of these days, I promise."

His sister stopped crying. James saw that she was asleep. He went back to his rug.

Page 10. James peered up at the cool round face of the moon. "I promised her that one of these days, one of these days..."

But he didn't finish what he was saying because he was asleep.

APPENDIX E

Scorer ______________________

Name of Child ______________________

Age ______________________

Time ______________________

	SD	SRI	Elaboration, Visual	Elaboration, Textual	Elsewhere in story	Other	Total # of Phrases	Fragments	Comments
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
TOTAL									

APPENDIX F

Two versions of the story by a Keresan Pueblo child.

In English	In Keres
1. I: Tell me what's going on in this picture. L: Um...the boy woke up.	1. L: Father looking and boy said, 'What do you see?'
2. L: The boy, he ride on a pony. She jumped over to the moon.	2. L: The boy was six years old. They bought a pony for the little boy and he was riding on the circle... was light and dark around. When night, stars were below.
3. L: The boy lay down she look at the moon.	3. L: Little boy looking up at moon and everybody asleep. The doll was also awake and looking up.
4. L: The boy go outside, it's raining.	4. L: Was walking on the moon and grass was long and when walking the rain stopped.
5. L: The jewelry is all getting fallen down.	5. L: Suddenly, the jewelry fell and baby doll screamed...they picked them up, and put it in their pockets.
6. L: The bag is all full.	6. L: They took...he took them up and put in bag and put the jewelry and the bag said, 'Fill me up'. That's all.
7. L: The baby doll has another one.	7. L: The boy gave the doll one jewelry to take and the boy got sad.
8. L: The little boy and the doll sit on the pony, they jump over the moon.	8. L: The boy and pony went up and baby in the back was crying.

9. L: The boy is carrying the baby.	9. L: Baby was crying in bed and boy got up and tiptoed and took baby outside and said to baby, 'Hush, baby, hush'.
10. L: The boy is sleeping... and she's baby.	10. L: Was dreaming in the moon... was dreaming in the moon and was dreaming while on the rug.

APPENDIX H

Sex __________ Age __________

Language first spoken at home ______________________________

Major language of first schooling ______________________________

Language most frequently spoken now ______________________________

As each word is read aloud, please write it in the appropriate blank in Column A. Write your first response to the word in Column B, and your second response in Column C.

	A	B	C
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

APPENDIX G

THEMES

SCORER ________________

DATE ________________

NAME OF CHILD ____________

AGE ________

STORY VERSION ________

LANGUAGE ____________

THEMES IN STORY

Rain ______

Medicine Bag ______

Jewelry ______

Crying ______

Dreaming ______

Horse ______

Moon ______

Father ______

Mother ______

Sister ______

Brother ______

Indian ______

Boy ______

Doll ______

THEMES IN DRAWING

Horse ______

Moon ______

Boy ______

Doll ______

Other Persons ____________

____

Medicine Bag ______

Jewelry ______

Rain ______

Tree ______

Other ______________

____

Comments: ____

____

Colors: ____

____

Please write down each word as it is read aloud. Then, close your eyes, register the image, and report what you "see" in as much detail as possible.

1. ____________________ ____

2. ____________________ ____

3. ____________________ ____

4. ____________________ ____

5. ____________________ ____

6. ____________________ ____

7. ____________________ ____

8. ____________________ ____

Comments: ____